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SPECIES OF CINCHONA OCCURRING IN U. S. COMMERCE, AND NOTES ON THEIR MICRO-BOTANICAL DETERMINATION; WITH ORIGINAL DRAWINGS.

BY J. C. REEVE, PH.C.¹

Of the accessible literature on the subject of cinchonas, as a practical guide, the National Dispensatory of Stillé and Maisch has been found the most useful. This is because it states no doubts, excludes all barks but those that are at all likely to be met with here, and straightens out the frequent tangles of nomenclature. The aim of this paper has been to state experience in practical work done on a limited variety of barks in a limited space of time, and to aid, if possible, beginners in this field.

The bark of the genus cinchona consists of:

1st. The liber or inner layer (endophlœum) consisting of parenchyma, in which is found the liber fibres (*Baströhren* or *Bastzellen* of the Germans). The medullary rays (*Markstrahlen*) pass into the bark, dividing this layer into the bast rays (*Baststrahlen*). The *Füllgewebe* is the "filling tissue" of parenchyma of these rays. In the bast rays are also found the "staff cells," "staff-formed stone cells" of Berg's Atlas,² or incomplete fibres of the Dispensatory; synonymous terms, as shown by the fact that there is but one corresponding structure in the bark, and that the two writers use the terms interchangeably.

2d. The middle or primary layer, middle bark (mesophlœum, green layer), or outer bark. In the parenchyma of this layer are the laticiferous vessels (*Safröhren* of Berg, lacunæ of Pereira), not anastomosing as in true laticiferous tissue, but separate, and mostly of large size. Here are also both thick- and thin-walled cells, containing a substance of resinous aspect; but undoubtedly it is only the thicker walled that are the resin-cells of the classification of the Dispensatory; the term

¹ Communicated by the Michigan University School of Pharmacy.

² "Anatomischer Atlas zur Pharmazeutischen Waarenkunde."

resin-cell in cinchonas is certainly limited to the thicker walled of the class. In support of this view the following may be stated: These cells have thick enough walls to be pronounced stone-cells; in Berg's classification resin cells do not appear, but the term stone-cell is used, and used only where the Dispensatory uses resin-cells. In addition,



Younger quill calisaya. x 40.



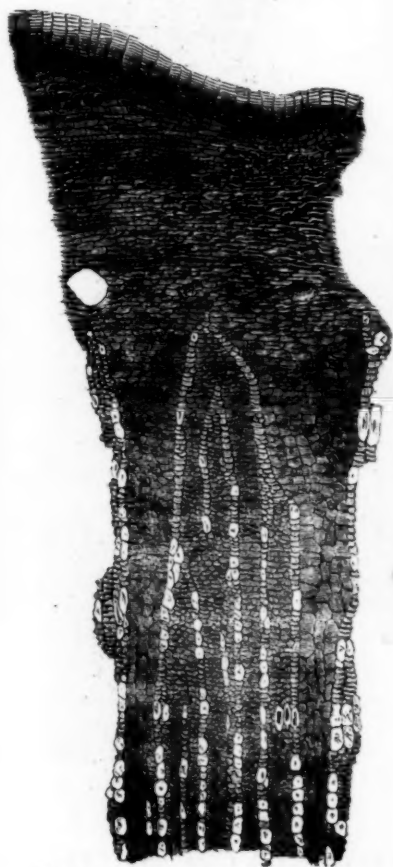
Older Calisaya. x 40.

we find in the Dispensatory, "Some species have . . . cells with thickened walls; . . . some of these cells contain a brown mass of resinous aspect, others are filled with crystals of calcium oxalate; hence the terms *resin-cells* and *crystal-cells*," and in the *Pharmacographia*¹ is found nearly the same expression. The conclusions are then, 1st, that

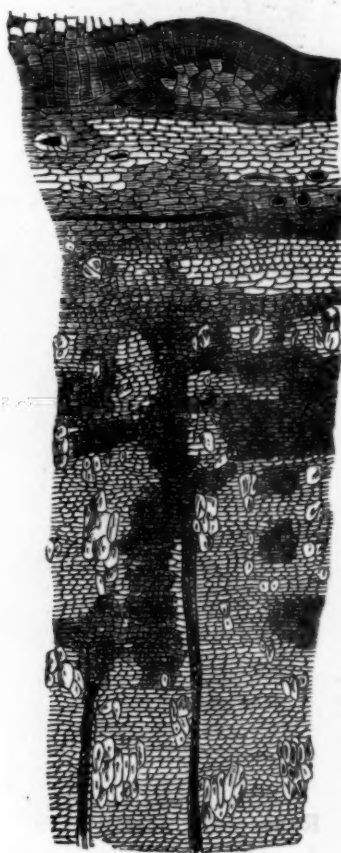
¹ Flückiger and Hanbury, p. 319.

under *cinchonas*, Berg's stone-cells and the resin-cells of the Dispensatory are the same, and therefore, 2d, that the "resin-cells" must be only the thicker walled.

The crystal cells, so often spoken of, are of little aid in classification. Their contents are granular, and slightly crystalline in appearance.



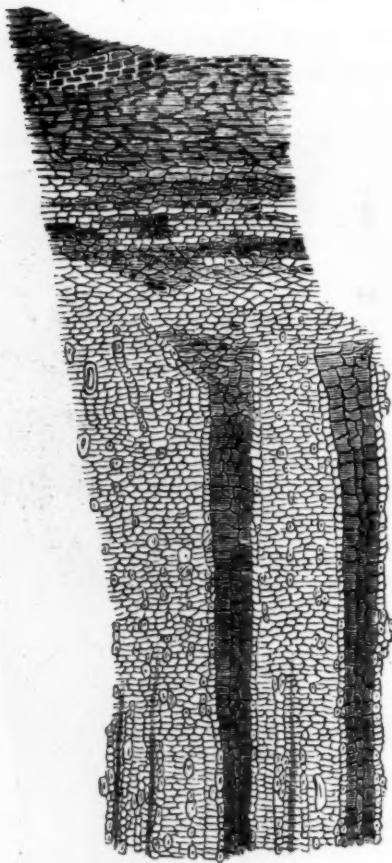
Cinchona succirubra. x 40.



Cinchona micrantha. x 40.
(Older bark.)

3d. The corky layer, of varying thickness (periderm). Sometimes this penetrates into the middle or even inner bark, forcing off the tissue external to it as *bark-scales*, itself forming rhytidoma (periderm of Weddell, Borke of the Germans). This secondary cork, or the effects of its growth, is always observable in older *C. calisaya*.

On these structures the following key¹ is arranged as a guide to descriptions:



Cinchona pitayensis. x 40.



Cinchona lancifolia. x 40.

Resin-cells absent.

LATICIFEROUS DUCTS PRESENT (in young bark). *C. calisaya*: Thickest fibres observed average mm. .095 in diameter. Fibres mostly separate.

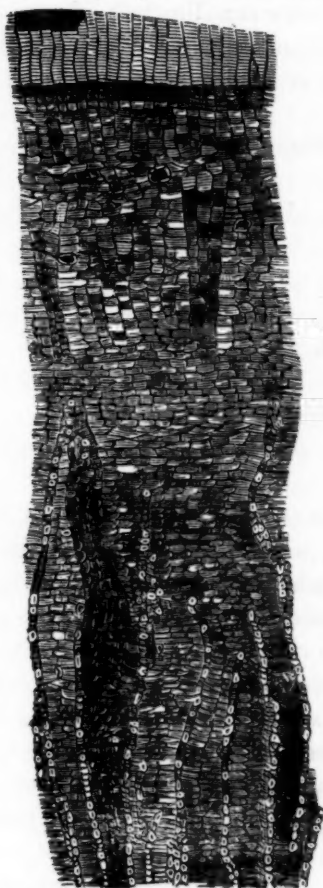
LATICIFEROUS DUCTS PRESENT (sometimes obscured in old bark (*C. succirubra*; thickest fibres average mm. .085 in diameter. Fibres in lines, and occasionally groups of 2 to 8.

LATICIFEROUS DUCTS PRESENT (soon obliterated). (*C. officinalis*.)

¹The key here given differs only slightly from that of the National Dispensatory or of Berg's Atlas, but the writer has included no statements which he has not verified, and has been able to make a few additions.

Resin-cells few or none (*i. e.*, they vary).

LATICIFEROUS DUCTS ABSENT. *C. micrantha*: Thickest fibres mm. .10 in diameter. Fibres in groups of 2 or 3, in older barks of more. Medullary rays thin and indistinct.



Cinchona cordifolia. x 40.



Cinchona purpurea. x 40.

C. pitayensis; thickest observed fibres average mm. .075. Thin fibres, mostly in single lines; section in places, or sometimes entirely light gray.

Resin-cells Present.

LATICIFEROUS DUCTS ABSENT. *C. lancifolia*: Thickest fibres average mm. .034. Numerous resin-cells. Fibres in line, or groups of 2 to 4, with some staff-cells. Medullary rays large-celled.

C. cordifolia: Thickest fibres average mm. .073. Resin-cells few. Medullary rays large-celled. Fibres small (sometimes few), in mostly single lines of 2 to 4, with some staff-cells. In some regions the fibres are dark red-brown, becoming bright rose-red with KOH.

LATICIFEROUS DUCTS PRESENT. *C. purpurea*: Thickest observed fibres average mm. .106. Numerous resin cells. Medullary rays broadly wedge-shaped. Fibres in groups of 3 to 5, with some staff-cells.

(*C. pubescens*: Numerous resin-cells. Medullary rays broad. Fibres large, in groups of 2 to 3, with staff-cells.)

(*C. scrobiculata*: Numerous resin-cells. Fibres very numerous, in uninterrupted, usually single lines.)

(*C. glandulifera*: Few resin-cells.)

(*C. peruviana*: Resin-cells, laticiferous ducts and fibres small. Many fibres incompletely filled, in lines of 2 to 6.)

Of the species in parentheses we have had so few specimens that our acquaintance with them is necessarily slight.

The following portions of descriptions, used and noted in determining species, have been taken from Berg:

Covered C. calisaya,¹ Wedd. Bark from the branches in quills. On outside dark brown, in places milk-white, with longitudinal ridges and deep longitudinal- and cross-markings, which form hollow squares. Fracture short and brittle. Periderm hard, brittle and dark brown. Bast indistinctly radially striate. Periderm consists of flat, tangentially-stretched cells, which contain a reddish-brown substance. Middle bark consists of tangentially-stretched cells, which contain starch and a brownish red sap, which on drying adheres to the cell-walls. The parenchyma of the bast rays have the same contents as cells of the middle bark; occasionally, separate cells are filled with a crystalline powder of oxalate of lime.

Uncovered C. calisaya (or older bark). Flat, occasionally covered with brittle, dark brown *bark scales* in layers. Where these are absent are shell like indentures. Fracture short and brittle. Bast-cells distinct, in quite close radial rows. The *bark-scales* consist of alternate layers of periderm and dead bark, whose inner layers already belong to

¹ That is, the bast covered with the middle and corky layers; usually the younger bark. When flat pieces have at least the laticiferous ducts left they belong to the variety *boliviana*.

the bast, consequently also containing bast fibres. The periderm consists of tabular cork cells filled with cinchona red. Medullary rays 2 to 4 rowed. Fibres are usually single, but occasionally in groups of 2 to 4, thick, often shortened, and yellow.

C. succirubra, Pavon. In flat pieces or quills, the quills covered on outside with a milky-white, longitudinally-furrowed, cross-marked periderm, which easily separates from the bast. Fracture fine. Quite thick middle layer of about 35 rows of thin-walled cells, filled with a deep-red coloring matter. Cells of the medullary rays are larger than those of the *Füllgewebe*. Fibres are orange, in places in interrupted rows, and are frequently tangentially arranged. In the older barks the cells of the smaller medullary rays can no longer be distinguished from the *Füllgewebe*, so that the broad bast rays are only bordered by the larger medullary rays.

C. micrantha, Ruiz and Pavon. Quills or flat pieces, the former mostly longitudinally-furrowed, the cross-markings faint, on outside grayish-brown, in some places ash-gray. Middle layer of young bark is contracted into a resinous ring; in older barks the periphery alone is darker. Middle bark consists of 25 to 30 rows of thin-walled cells, frequently containing a crystalline powder, usually without stone cells. The cells of the *Füllgewebe* are not conspicuously smaller than the cells of the wedge-shaped medullary rays. Fibres in interrupted rows; in older barks toward the centre thicker, separate, or in from 2 to 8, mostly 2-rowed groups.

C. pitayensis, Wedd. Curved plates or broken pieces, with a spongy, ochre colored, light- or dark-brown layered, square-cut, easily-removed cork, and a cinnamon-brown, hard, dense bast; underside finely striate, short and fine-fibrous. Middle bark of about 30 cell-rows. Medullary rays wedge-shaped. Cells of the *Füllgewebe* not noticeably smaller than those of the medullary rays. (On this point the drawing is not characteristic.) Fibres of uniform thickness in interrupted radial rows. (One variety contains a few stone-cells.)

C. lancifolia, Mut. Flat, curved, or very seldom quilled, of varying thickness, on outer surface with an almost silvery-white, faint ochre-yellow cork, somewhat glistening, very soft, easily removed. Bast ochre colored or orange-yellow, stringy; on fracture long and thin splintering. Middle bark with about 20 rows of cells. Fibres form single or double rows, not seldom found in groups, mixed with many

thin staff-cells. The thick-walled "sap-cells" (stone-cells) forming a coherent aggregation, are often found also in the outer bast. Cells of the medullary rays are larger than those of the *Füllgewebe*.

C. cordifolia, Mut. Flat, curved or in quills. Outer surface quite even, longitudinally-wrinkled or furrowed with soft, yellowish, somewhat shining, in places removed cork. Short fibrous. Bast with rows of fewer small fibres. Middle bark of about 35 cell rows. Bast rays with small-celled *Füllgewebe*. Fibres in interrupted radial rows, often in one region much more numerous than in a neighboring, sometimes very scarce.

C. purpurea, R. and P. Quills, with quite even, longitudinally-wrinkled cork, occasionally possessing tender cross-marks or even corky warts, yellowish-white or yellowish gray (cork), in places of whiter color, later replaced by secondary cork. Middle bark of 35 to 40 cell rows. Two neighboring circles of laticiferous ducts, which later become filled up chiefly by endogenous cell-building, separate the bark from the bast. The wedge-shaped medullary rays generally contain stone-cells. The *Füllgewebe* consists of cells, which are smaller than the tangentially stretched cells of the medullary rays. Fibres gold- to orange yellow, indistinctly arranged in tangential zones, occasionally united in groups. Thin staff-cells are found in the *Füllgewebe*.

Of the barks obtained from leading wholesale houses of New York, Philadelphia, St. Louis, Detroit and New Orleans, and from eleven retail stores, 38 out of 63 were officinal species.

Of 22 barks sold as true red, 13 were *C. succirubra*, 4 *C. lancifolia*, 2 *C. purpurea*, 1 was *C. cordifolia*, 1 *C. peruviana* and 1 *C. calisaya*.

Of 11 specimens designated as red, ordinary red or commercial red, 2 were *C. succirubra*, 6 *C. lancifolia*, 1 was *C. peruviana*, 1 *C. scrobiculata* and 1 *C. purpurea*.

Of 15 barks sold as true calisaya, 10 were *C. calisaya*, 2 *C. pitayensis*, 1 was *C. lancifolia*, 1 *C. pubescens* and 1 *C. scrobiculata*.

Of 5 barks, ordinary or commercial yellow, 3 were *C. calisaya*, 1 was *C. officinalis* and 1 *C. pitayensis*.

Five pale or gray barks were found to be *C. micrantha* 1, *C. officinalis* 1, *C. pitayensis* 1, *C. calisaya* 1, and *C. glandulifera* 1.

Three pitayo barks were each *C. pitayensis*, and two barks sold as Columbian were found to be of the proper species of this commercial bark—*C. lancifolia* and *C. cordifolia*.

It will be seen that the yellow barks are much better than the red; 62 per cent. of the former, but 45·4 per cent. of the latter were officinal. The character of the wholesale barks is much better than of the retail; 50 per cent. of the retail and 51 per cent. of the wholesale were officinal; but the unofficinal species of the wholesale houses were more frequently sold under their proper designations.

In connection with this, some reported assays of these unofficinal barks might be interesting, though it is feared they have been made on commercial lots instead of on quantities in which every piece has had its botanical origin proved.

C. peruviana: Total alkaloids 2·06 to 6·25 per cent., mostly cinchonina and cinchonidia.

C. pitayensis: 3·2 per cent. quinia (Jamieson, "Pharm. Journ. and Trans.," Sept. 1, 1865), 1·15 per cent. quinia sulphate, 2·3 per cent. crystallized cinchonina (M. Guibourt, "Am. Jour. Pharm.," March, 1854, p. 185), 5·85 per cent. quinia sulphate, 4·19 per cent. quinidia and cinchonidia, 1·3 per cent. cinchonina ("Annales des Sciences Naturelles," vol. xii, series 5, p. 39).

C. lancifolia: 1·25 to 2·5 per cent. quinia sulphate, ·25 to 1·5 per cent. cinchonina sulphate (Karsten, "Pharm. Journ. and Trans.," Sept. 1, 1858), ·9 to 1·9 per cent. quinia sulphate ("Am. Jour. Phar.," March, 1854, p. 185), 1· to 3·5 per cent. quinia, 0 to 4·5 quinia; cinchonina and cinchonidia are quite prominent in some varieties, but wanting in others ("Ann. Sci. Nat.," vol. xii, series 5, p. 33).

C. scrobiculata: Quinia sulphate ·4 per cent., cinchonina sulphate 1·2 per cent., quinia ·44 per cent., quinidia ·63 per cent., cinchonina ·86 per cent. ("Ann. Sci. Nat.," vol. xii, series 5, p. 47).

C. cordifolia: Quinia sulphate 1·2 to 1·4 per cent., cinchonina sulphate ·5 to ·6 per cent. ("Ann. Sci. Nat.," vol. xii, series 5, p. 71).

(We have seen but one "spurious cinchona," genus *Ladenbergia*, species probably *magnifolia*, and this origin was indicated by its label—*Cinchona bicolor*.)

Ann Arbor, Mich., June 23, 1880.

ON THE STABILITY OF CALOMEL.

BY PHIL. HOGLAN.

The "Druggists' Circular" for August, 1880, contains some of the results of M. Verne's experiments on the stability of calomel, as reported in the "Bulletin de Thérapeutique." It is there stated that calomel, mixed with sugar, chloride of sodium or citric acid, undergoes no change, and also that the assumed danger of acid drinks, taken when using calomel, "is pure prejudice," since calomel in solution with citric acid for fifteen days underwent no change. M. Verne concludes from his experiments that calomel is a much more stable compound than generally supposed, and that chloride of sodium, at 40°C ., has no action whatever on calomel. That the subject of this article is a much vexed question the reader will readily see by referring to the U. S. Dispensatory, 14th ed., pp. 1247—8, where experiments are quoted to prove both the stability and the unstability of calomel.

The following experiments were conducted for the purpose of ascertaining the correctness of M. Verne's conclusions, and also with a view to discover the cause of the discrepancies among different experimentalists on this important question:

1. Calomel was added to a solution of chloride of sodium and allowed to stand ten days with frequent agitation, after which the filtered liquid gave no evidence of the presence of corrosive sublimate by the stannous chloride test.

2. Calomel and chloride of ammonium, treated in the same manner, gave no evidence of corrosive sublimate being formed.

3. Calomel was added to a dilute solution of hydrochloric acid, and after twenty-four hours the filtered liquid gave a slight reaction with stannous chloride, indicating a trace of corrosive sublimate. The above experiments were conducted at a temperature of about 78°F .

5. A mixture of calomel and a solution of chloride of sodium was kept at a temperature of 98°F . for two hours, then filtered; the filtrate gave a grayish coloration with stannous chloride, thus indicating the presence of corrosive sublimate, and showing that, contrary to M. Verne's conclusions, chloride of sodium acts on calomel even below 40°C .

6. Calomel and a solution of chloride of ammonium, treated in the same manner as in experiment "5," gave the same reaction.

7. Calomel and water were shaken together and kept at a temperature of 98°F . for three hours, when the filtered liquid gave a slight

reaction with stannous chloride, indicative of the presence of corrosive sublimate, though not so marked as in the two preceding experiments.

8. Calomel and dilute hydrochloric acid were treated, at 98°F., in same manner, and after one hour a very distinct grayish coloration was had with stannous chloride. The same occurred with citric acid.

Summary.—Experiment "7" shows that calomel, at the temperature of the body (98°), is slowly converted into corrosive sublimate. Experiments "5," "6" and "8" show that chloride of sodium, chloride of ammonium, hydrochloric and citric acids further this change of calomel into the poisonous chloride, and are hence more or less dangerous when existing in the system with calomel. The result of the above eight experiments would seem to indicate that the different temperatures at which the experiments are conducted will explain in part the discrepancies on this subject. The experiments further show that at the temperature of the body calomel is an unstable compound.

The question of the conversion of calomel into corrosive sublimate by sugar, magnesia, bicarbonate of sodium and carbonate of magnesium was next taken up and the following experiments performed:

A. Calomel and sugar were rubbed together, and after twenty-four hours a test for corrosive sublimate failed to indicate its presence, and no trace of the poisonous compound could be discovered in the powders, even after fifteen days.

B. Calomel and magnesia, treated in same manner, gave evidence of corrosive sublimate after twenty-four hours.

C. Calomel and carbonate of magnesium gave same results as in experiment "B," as did also calomel and bicarbonate of sodium.

The results of these experiments, except "A," agree with the assertion of G. Velpins (*loc. cit.*).

These two sets of experiments would seem to prove that M. Verne's conclusions are not altogether correct; that temperature is a great factor in considering the question of the stability of calomel; that M. Berthe's statement (*loc. cit.*) in regard to the conversion of calomel into corrosive sublimate at high temperatures is correct, and prove also the correctness of M. Mialhe's assertion that the alkaline chlorides increase the activity of calomel.

Newcomerstown, Ohio, October 11, 1880.

PHARMACEUTICAL NOTES.

BY R. F. FAIRTHORNE, PH.G.

Ointment of Oxide of Zinc.—A very smooth ointment can be made from the ingredients composing the officinal oxide of zinc ointment, if the oxide is first triturated and mixed with glycerin in a mortar, and after rubbing sufficiently long to produce a uniform mixture of the consistence of syrup it is incorporated with the lard. This will produce an ointment that is of satisfactory appearance, and does not become rancid; at least some of it made a month ago has not undergone any change, though exposed to the air and summer heat during part of that time. In connection with this subject, I would state that during that time of the year in which the thermometer indicates a temperature varying from 75° to 95° Fahrenheit the consistence of the officinal ointment is too thin for convenience of application in many cases, and by request of patients and physicians, I have frequently improved its condition by the addition of 40 grains of white wax to each ounce of the salve, and deducting that amount from the weight of the lard used. Another method, which has been successfully employed by Mr. Jas. T. Shinn, is to melt the lard and pass the oxide through a sieve, allowing it to fall into it, stirring the mixture at the same time, and until cold or hard enough to prevent separation. It is, perhaps, almost unnecessary to add that there is an advantage in employing lard that has been benzoated.

Making Soap by Cold Process.—A good hard soap can be easily produced if 4 pounds of olive or sweet almond oil are mixed with 2 pounds of soda ley, of the strength 36° Baumé, and stirred until of the consistence of thick paste, when it should be poured into moulds, covered by several folds of muslin, and kept in a warm room for 20 hours. By this treatment the process of saponification, or union of the acids in the oils with the alkali, is complete. When these materials are first mixed the temperature of the mass rises, and in order to effect the entire union of ingredients so as to form the compound called soap it is necessary that the heat thus generated should be maintained for some time, hence the necessity for covering the moulds and keeping them in a warm room.

I have found that it is desirable to use oil that is slightly rancid, or, if free from rancidity, to add about 10 per cent. of oil that has become so. Oil that is perfectly sweet requires two or three days to effect

saponification. Soap thus made, after a few days is as hard and dry as that article generally is when several years old when made in the usual manner.

A Substitute for Neutral Mixture can be made by placing the solid ingredients employed in making the solution of citrate of potassium in a mortar and rubbing them together with a small quantity of fresh lemon peel, adding the water and straining through muslin. To each ounce of the solution 5 grains of sugar are added.

This forms an agreeable substitute for neutral mixture, quite as pleasant and efficient and more uniform in strength. The small amount of sugar added increases its resemblance to that made from the lemon juice.

Syrup of Orange Peel.—If two fluidounces of a tincture of sweet orange peel, prepared in the same manner and of the same strength as the officinal tincture of bitter orange peel, are mixed with fourteen fluidounces of simple syrup, a syrup is formed that is equally pleasant in taste and appearance to that made by the formula of the U. S. Pharmacopœia, containing about the same amount of alcohol, and free from the objection that may be made to that preparation on account of the presence of a small amount of magnesia, thereby rendering it incompatible with solutions containing alkaloidal and metallic salts.

INDEXING FOR PHARMACISTS.

BY CHAS. DYER CHASE, PH.G.

Few pharmacists know or appreciate the value of indexing; it is the best artificial memory known, and is useful in every trade and profession. It is common for men of affairs: lawyers, editors, statesmen and literateurs to have some system of indexing, although they vary in their methods.

This subject is one that has interested me for a number of years. I have tried one system after another, and finally settled upon the card index as combining in itself note-book, scrap-book, formula-book and index all in one. This is the system that is used by the large libraries in this country and in Europe in cataloguing their books, and is the one spoken of by Mr. Hans M. Wilder in his too short article in the "Journal of Pharmacy" for May, 1877. Perhaps some have never seen a card index, so I will simply say that mine is made of a good

quality of stiff ledger paper, cut to the size of postal cards, standing on edge like envelopes in a box, and arranged in a strictly alphabetical order; being put in loosely they can be moved backward and forward, swinging on their lower edges, and easily read without lifting from the box unless one wishes to. I do not see what Mr. Wilder's card press can be, nor do I see any necessity for one.

Note-books, scrap-books and others of that ilk are good enough so far as they go, but they do not go far enough; they are practically useless without an index, and how few of them ever have one. In using the index, as a scrap-book, I paste the scrap on a card, leaving room at the upper edge for a catch-word. If the scrap is too long for one side of the card I turn up the lower end and paste it upon the back; if too large for one card I paste it upon two, tying them together by the corners with a piece of thread. If too large for two cards I fold it, put it in a cheap envelope, and with a note of its contents, or a number on the upper edge, file it away in my envelope index, which is arranged exactly like the other, making a note of the fact in my card index. A box of cheap manilla envelopes can be bought at a very low price, and are much better than any scrap-book. If you *must* have a scrap-book do not buy a clumsy thing at the stores, but get some sheets of good stiff paper the size you want, number each sheet and paste your scraps *only on one side*, and as soon as you have done it do not forget to index it or it loses the most of its value. Index in this way: Squills, syr. of, S. B., 7.2.4; *i. e.*, syrup of squills, scrap-book, page 7, second column and fourth scrap (or still better, $\frac{4}{10}$ of the length of the column from the top).

The contents of my old note-books and books of formulas I have transcribed on cards, each item or fact upon a separate card and placed in my index—items or formulas that at one time were scattered around in different books so that it would have taken one a long time to gather them together for comparison, etc., are now in one place, and I can lay my finger upon any of them in a moment.

One advantage of having formulas written upon these cards is that they can be taken out and pinned up against the wall or shelf in front of the person using them, and out of the way of dirty hands, a wet counter or sloppy dishes; when done with they are put back in their proper place. When a formula has become out of date or is succeeded by a better one it can be thrown away and the new one put in its place. By going over it occasionally it is an easy matter to sift out what is no

longer of value—the chaff from the wheat. It is capable of indefinite expansion or contraction—unlike a book, it can be added to or taken from without interfering with its true alphabetical arrangement.

For a number of years I have been in the habit, when reading my pharmaceutical or other journals, of checking off with the initials of my name on the margin of the page (if borrowed on a piece of paper) such articles or items as I wished to bear in mind for possible future use; on finishing the magazine I would go over it again, pen in hand, and index them. In checking I have used a red pencil, as I found that it more readily catches the eye when running the leaves between the fingers. The mark of a black lead pencil will often escape observation.

I always carry a supply of blank cards around with me in a pocket; when I run against an item or fact that I want to preserve I jot it down with a stylographic pen, with an appropriate catch-word on the upper edge and reference at the bottom, and when I get home, instead of copying it into a book and burying it forever, I just slip it into its proper place in the index, and I know where to put my finger on it when it is wanted.

To facilitate reference I have some of the cards cut about a quarter of an inch higher than the others, with the letters of the alphabet or some catch-word upon the part that projects above. There are zinc guides made for the purpose, but they cost several cents a piece, and as I like to use as many as possible I find that the paper ones are good enough for a private index that is not to be handled by every one.

Fine calendered paper, demy, and twenty-three pounds to the ream, is about the right thing to use for the index cards, and a quire will cut about 500. I buy mine ready-cut and pay \$1.50 a thousand. In a small way it would be a good plan to get a tinsmith to cut out of good heavy tin a piece the size and shape of a postal card, by means of this one could cut or tear pieces of paper of the right size, and business notes, memoranda, etc., may also be rapidly torn or folded to a shape to fill in an index of their own.

I have just made a most convenient little paper weight to hold a book open when copying, or paper in place when writing upon it. I took a piece of square brass tubing, $\frac{3}{4}$ inch in diameter by 6 inches long, filled it with type metal, polished it with emery paper and gave it a coat of shellac. It weighs 20 ounces, and is the most convenient thing on my writing table.

Boston, September, 1880.

SHORTHAND FOR STUDENTS.

BY CHAS. DYER CHASE, PH.G.

The time is rapidly approaching, if not now here, when the student will be seen leaning over his desk and scratching away for dear life, trying to keep up with the remarks of the professor, who must, I think, find it extremely interesting work talking to the backs of so many heads.

Although I do not believe in so much note-taking at lectures, many do, and to lighten their labors a little I would suggest that they buy a little book entitled "Brief Longhand," by A. J. Graham, 69 Bible House, New York. It is "a system of longhand contractions, by means of which the principal advantages of shorthand are secured without resort to stenographic characters, and with perfect legibility."

A regular system of phonography, like Pitman's, Munson's or Graham's, is of course the best, but to the pharmaceutical student I do not think that the result obtained would repay for the labor necessary to its acquisition. This system of brief longhand, however, is so simple, so easily learned, and the benefits resulting so immediate, that I would recommend all students in the habit of taking notes to get the book and study it. I have found it of great benefit myself, not only in making abstracts, quotations, etc., but also in writing upon index cards, where I can get twice as much in the same space and do it twice as fast as I could formerly.

The system is divided into three styles; the first, or corresponding style, can be acquired by an hour's earnest study, and will save fifteen per cent. in time. The following is an example:

I call tt mind free wh s jealous v is own freedom, wh guards iself fr bng merged i oths, wh guards is empire over iself z nobler than e empire v e world.—*Channing.*

I call that mind free which is jealous of its own freedom, which guards itself from being merged in others, which guards its empire over itself as nobler than the empire of the world.—*Channing.*

The second style is simply the first with additions, and results in a saving of thirty per cent. Example:

I h oftn hd occsn t rmrk e firtde w wh wmen sstn e mst ovrwhlming rvrss v frtn. E dsstrs wh break dwn e sprt v a man. & prstrte hun i e dust, seem t ell frth -l e enrgs v e sft sex, & g sch intrpdy & elevtn t thr chrc, tt -t times i apprchs t sblmty.—*Irving.*

I have often had occasion to remark the fortitude with which women sustain the most overwhelming reverses of fortune. The distresses which break down the spirit of a man, and prostrate him in the dust, seem to call forth all the energies of the softer sex, and give such intrepidity and elevation to their character, that at times it approaches to sublimity.—*Irving.*

In the third style contractions are employed to the utmost extent consistent with legibility, and the majority of the vowels and silent consonants are omitted.

"It is designed for use in all cases where legibility is secondary to the saving of time and labor, as in copying letters, in making abstracts of and quotations from works read, in rough-sketching business and literary papers, and in taking notes of testimony, lectures, sermons, etc.," and saves about fifty per cent. in time. Example:

. Sm bks rtb tstd; os tb swld, & sm fw tb chwd & dgstd; tts, sm bks rtb rd -nly i prts, os tb rd bt n crsly; & sm fw tb rd whly & w dlge & -tn.—*Bacon.*

Some books are to be tasted; others to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read but not curiously, and some few to be read wholly and with diligence and attention.—*Bacon.*

These few examples will give a fair idea of the system; I might have made them fuller, but did not wish to take up too much space. As will be seen, the first and second style can be read at sight by any one, whether acquainted with the system or not, and the third by a little extra attention. The third style can be still further extended by the substitution of some of the phonographic word-forms for a few of the more common words; by this means, one can glide almost imperceptibly into a knowledge of phonography, while at the same time his brief-longhand is as valuable to him as ever.

In studying brief-longhand, I cut out Part I, put it in a stiff paper cover, and carried it around in my coat pocket, taking it out when I had opportunity (as at meal hours and in the evening in the intervals between waiting upon customers) and studied it; and the same with Part II. The book is cheap enough, costing only sixty-three cents; and if you want to keep a whole copy, buy another one. I am fond, myself, of little books, that can be put in a coat pocket and pulled out when opportunity offers.

Boston, October 5, 1880.

CHEMICAL NOTES.

BY PROF. SAMUEL P. SADTLER, PH.D.

Inorganic Chemistry.—*Preparation of chemically pure Soda.*—According to an observation of Gerresheim, any chlorine or sulphuric acid which may be present in a soda solution is completely removed by

shaking up the solution with Millon's base, the product obtained by the action of ammonia upon mercuric oxide. Endemann and Prochazka propose to use this reaction for the preparation of chemically pure soda. For this purpose, they shake up some 2 liters of soda solution with 30 grams of the base once or twice daily for a week. As the free ammonia cannot be completely removed from Millon's base by washing, it is neutralized by adding mercuric oxide to the soda solution.—*Chem. Industrie*, iii, p. 273.

Preparation of pure Phosphoric Acid.—According to A. Ditte, pure phosphoric acid may be easily obtained by saturating a solution of sodium phosphate with hydrochloric acid gas, decanting the clear liquid from the precipitated common salt and distilling off the excess of hydrochloric acid.—*Comptes Rendus*, 90, p. 1163.

Red Antimony.—As the opinions concerning the composition of red antimony still differ, in spite of the manifold investigations recently made, and several new text-books class it among the oxysulphides, and others among the trisulphides of antimony, N. Teclu has undertaken a series of careful analyses of this compound, so as to enable him to decide this point and also to determine whether the product prepared, according to Wagner's method, from tartar, differs in composition from that obtained from chloride of antimony. It was found that red antimony in both cases consists merely of antimony and sulphur, its composition being Sb_2S_3 . Its formation by both methods may be illustrated by the following equations:

- (1) $2\text{C}_4\text{H}_4\text{KSbO}_7 + 3\text{S}_2\text{O}_3\text{Na}_2 + \text{H}_2\text{O} = \text{Sb}_2\text{S}_3 + 3\text{SO}_4\text{Na}_2 + 2\text{C}_4\text{H}_5\text{KO}_6$.
- (2) $2\text{SbCl}_3 + 3\text{S}_2\text{O}_3\text{Na}_2 + \text{H}_2\text{O} = \text{Sb}_2\text{S}_3 + 3\text{SO}_4\text{Na}_2 + 6\text{HCl}$.

The formation of sulphurous acid, which is invariably observed during the preparation of this compound, and the presence of free sulphur in the product after extraction with carbon disulphide, point to the simultaneous result of a secondary process, which consists in the decomposition of sodium thiosulphate by means of tartaric or hydrochloric acid.—*Dingler's Polytech. Jour.*, 236, p. 336.

Detection of Water in Alcohol and Ether.—C. Mann gives the following process: Mix 2 parts citric acid and 1 part of molybdic acid; heat until incipient fusion and warm with 40 parts of water. Filter-paper dipped in this and dried at 100° is blue. In alcohol or ether free from water the color remains unchanged, but if water be present the paper will lose its color, especially if warmed.—*Ibid.*, 236, p. 430.

Vapor-density of Chlorine.—Victor Meyer gives the results of some

new determinations of the density of chlorine, made with the greatest care and with the elimination of all known sources of error. Instead of the value 1.63 previously given by him, he obtains now 2.05, a number still considerably lower than the normal density, 2.45. This shows that the abnormal change in the density of chlorine only takes place at a much higher temperature than that necessary for iodine. It may be, therefore, that the density of free chlorine (not liberated in *statu nascendi* from platinous chloride), when determined at very high temperatures, may change also to a degree. The experiments with free chlorine have not as yet been carried out at the highest temperatures. This Meyer proposes to do shortly.—*Ber. der Chem. Ges.*, xiii, p. 1721.

Organic Chemistry.—*On the Recognition and Determination of Traces of Carbon Disulphide.*—Prof. A. W. Hofmann gives a means of determining with accuracy very small amounts of carbon disulphide. The firm of Schimmel & Co., in Leipzig, had found in a large shipment of mustard oil received from Russia such amounts of carbon disulphide that reclamation was at once made on the ground of adulteration. The Russian firm then stated that in the preparation of mustard oil from *Sinapis juncea*, the variety used in Russia, carbon disulphide was necessarily formed. Prof. Hofmann, being called as an expert, testified that such large quantities could not be produced in the process of manufacture, but at the same time gave, as the result of experiment, the statement that small amounts were found in all the mustard oils, both natural and synthetical. Thus in oil from *Sinapis juncea* he found in two determinations 0.41 and 0.37 per cent.; in oil from *Sinapis nigra*, 0.51 and 0.56 per cent., and in artificial mustard oil, made from allyl iodide and ammonium sulphocyanate, 0.32 per cent. of carbon disulphide. These small amounts could be shown qualitatively by the aid of the xanthogenate of copper reaction, but not determined quantitatively. A means of determining even the slightest trace, with accuracy, was found in the use of triethylphosphin, which with carbon disulphide yields rosy-red prisms of the compound $(C_2H_5)_3PCS_2$. 100 parts, by weight, of this precipitate correspond to 39.1 parts of CS_2 . The occurrence of carbon disulphide in all the preparations of mustard oil, including that prepared synthetically, Hofmann ascribes to a secondary reaction, whereby a aqueous vapor first liberates hydrogen sulphide from the oil, and this, acting upon the allyl sulphocyanate, liberates carbon disulphide.—*Ibid.*, xiii, p. 1732.

On the Preparation of Tannic Acid.—The pulverulent tannin, as

brought on the market hitherto, is changed, in part, when dried into gallic acid, and therefore will not dissolve to a clear solution, is very hygroscopic, and forms in consequence, very readily, compact lumps, which make it difficult of solution. To avoid these points of difficulty, E. Schernig (Chemical Joint Stock Company) has patented a process whereby an aqueous, alcoholic or etherial solution of tannin is evaporated *in vacuo* until, on cooling, the mass can be broken in pieces. These are placed in a double-walled vessel, heated by steam, the bottom of which is perforated so that the softened tannin on melting runs through. The threads of tannin fall upon rapidly rotating wooden or metallic cylinders placed some 5 meters below, from which the finished material is taken off and broken up. The brittle needles, of golden lustre, so obtained are not hygroscopic, do not form lumps, dissolve easily and in clear solution, and contain no decomposition products.—*Dingler's Polytech. Jour.*, 237, p. 480.

On a New Hydrocarbon from Sequoia gigantea.—G. Lunge and Th. Steinkauler have distilled with steam the needles from branches of the California *sequoia*, and, after extracting with ether, have separated therefrom a solid body and an oil. The solid is quite soluble in ordinary solvents, and could only be crystallized by putting a layer of water upon the solution in glacial acetic acid, so that by gradual mixing it might cause the separation out of the solid. In this way it was gotten in the form of well-crystallized scales, which were white, with faint blue fluorescence, and possessed a very penetrating odor of the sequoia, which here resembled somewhat the odor of oil of peppermint. The fusing-point was found to be $105^{\circ}\text{C}.$, and the boiling-point between 290° and $300^{\circ}\text{C}.$ An analysis gave figures corresponding to the formula $\text{C}_{13}\text{H}_{10}$, to which confirmation was given by a determination of the vapor-density. While this formula is the same as that of fluoren, the fusing-point distinguishes it (fluoren has a fusing-point $113^{\circ}\text{C}.$), and the very characteristic odor leaves no chance of confusion between the two. The authors therefore call the new body Sequoien. The oil accompanying it they have not fully investigated as yet.—*Ber. der Chem. Ges.*, xiii, p. 1656.

On Apophyllenic Acid and Cotarnin.—In the decomposition of narcotin by oxidation with manganese dioxide and sulphuric acid, Wöhler obtained, besides opianic acid and cotarnin, an oxidation product of this latter substance, an acid containing nitrogen, which, because of the resemblance of its crystals to the mineral apophyllite, he named

apophyllenic acid. The conditions of its formation and its composition were not determined, however. It is difficultly soluble in cold, more readily soluble in hot water, insoluble in alcohol and ether. It fuses, with partial decomposition, at 241° to 242°C . An analysis gave figures corresponding to $\text{C}_8\text{H}_7\text{NO}_4$. On strong heating, it decomposes, giving a pyridinic odor. Heated with strong hydrochloric acid, in sealed tubes, to 240° to 250°C ., for two to three hours, it is decomposed, yielding the methyl group to the hydrochloric acid, and there remains a crystallizable acid, $\text{C}_7\text{H}_5\text{NO}_4$. A study of the salt of this acid shows it to be identical with the dicarbopyridinic acid of Hoogewerff and Van Drop (this journal, Aug., 1879, p. 397) or the cinchomeronic acid of Weidel (this journal, *loc. cit.*) The apophyllenic acid is simply the acid methyl ether of this dibasic acid. A pyridin derivative is therefore found among the decomposition products of an opium alkaloid, which makes it probable that the opium alkaloids, equally with the alkaloids of the cinchona bark, are to be considered as pyridin or chinolin derivatives.—*Ibid.*, xiii, p. 1635.

On the Official Quinia Test of the German Pharmacopæia.—O Hesse publishes a criticism of Kerner's sulphate of quinia test (see this journal, 1880, p. 423, and 1862, p. 417), now the official German one. According to this test, if a clear solution remain after the addition of ammonia water, the quinia is practically free from cinchonidia sulphate. Kerner recently claimed to have improved this test so that $\frac{1}{10}$ per cent. of cinchonidia sulphate could be detected. This was to be done by adding ammonia solution in amount insufficient to dissolve the separated alkaloids, and then to determine volumetrically the amount of ammonia solution necessary for their complete solution. Hesse says that this test is worthless, inasmuch as cinchonidia sulphate, freshly precipitated, dissolves more readily in ammonia solution than quinia itself. Later, it is true, follows a separation out of crystallized cinchonidia sulphate, while the ammoniacal quinia solution remains clear. As the cinchonidia sulphate becomes an impurity in quinia sulphate, not by designed admixture, but because of its crystallization, so it is in a form in which it escapes to a greater or less degree detection by the Kerner test. Hesse then gives a table showing that in some preparations as much as 10 per cent. cinchonidia sulphate may be present, and yet a clear solution may result. He also considers that the amount of water of crystallization may indicate whether or not a sample of quinia sulphate is contaminated with cinchonidia sulphate. Pure sulphate of quinia, which is not effloresced,

contains 16.17 per cent. of water, while cinchonidia sulphate contains 13.7 per cent. of water; so that if a sample of quinia be not effloresced, and contain less than the 16 per cent. of water, it is because of admixture of cinchonidia sulphate.—*Ibid.*, xiii, p. 1517.

On Hyoscina.—Ladenburg made mention, some little while ago (this journal, July, 1880, p. 368), of the fact that *hyoscyamus* contained two alkaloids—a crystalline one, now known as hyoscyamina, and an amorphous one, which he had not as yet studied fully. He now describes this in full. It remains in the mother-liquor after the removal of the crystallizable alkaloid, and comes into commerce as a brown, thickish syrup. It can be extracted by the formation of the gold salt, which is less soluble than hyoscyamin-gold-chloride. The alkaloid, for which he proposes the name Hyoscina, when purified and decomposed by baryta water, gave tropic acid and a base isomeric with but distinct from tropia. In conclusion, the composition of the associated alkaloids is thus presented:

1. Atropia, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and tropia, $C_8H_{15}NO$.
2. Hyoscyamia, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and tropia, $C_8H_{15}NO$.
3. Hyoscina, $C_{17}H_{23}NO_3$, splits up into tropic acid, $C_9H_{10}O_3$, and pseudotropia, $C_8H_{15}NO$.
4. Homatropia, $C_{16}H_{21}NO_2$, splits up into mandelic acid, $C_8H_8O_3$, and tropia, $C_8H_{15}NO$.

—*Ibid.*, xiii, p. 1549.

GLEANINGS FROM THE FOREIGN JOURNALS.

BY FREDERICK B. POWER.

Studies on the Constituents of *Scilla maritima*. By A. Riche and A. Rémont.—One of the authors, having been commissioned to report upon a fat employed as a rat poison, and which was found to contain squill, was led to extend his studies to the various constituents of the bulb.

They find that the bitterness of the bulbs is very different in comparing even the scales taken from the same portion, and that the juice may be saccharine, and not at all bitter. This circumstance could be attributed to the time of collection, to a variety of species, or to certain principles which are capable of undergoing modification. The latter is supposed to play an important part, and is attributed to a ternary principle, comparable to soluble starch, gum or to inulin, which they

have succeeded in isolating, and for which the name of *Scillin* is proposed, the name of *Scillitin* having been applied to the bitter, toxic principle. (The name *scillin*, as suggested by the authors, is an unfortunate one, having already been applied by Merck, of Darmstadt, to a crystallizable, toxic principle [see "Am. Jour. Phar.," Aug., 1879]). The *scillin* of the French authors was found to be readily converted into sugar, either by the action of acids as also, probably, by diastase or an analogous ferment contained in the plant. Being of itself not saccharine, the bitterness of the squill is supposed to diminish in proportion to its transformation into *lævulose*; the easy change of the *scillin* into *lævulose* explaining also why very little of that substance can be found in the dried powder, in which, on the contrary, sugar predominates.

The proportionate constituents of three bulbs taken at the same stage of development is then appended:

Proportionate composition.	Very bitter bulbs.	Slightly bitter bulbs.	
Water,	73.30	72.00	77.57
Cellulose and insoluble salts,	15.59	19.80	12.53
Scillin,	8.50	6.84	8.03
Sugar,	0.17	0.15	0.68
Soluble mineral matter,	0.32	0.24	
Scillitin,			
Oxalic, citric and malic acids, }	2.12	0.97	1.19
Undetermined substances.			

For the extraction of the *scillin* the expressed juice was neutralized by carbonate of lime, the decanted liquid distilled in vacuo in the presence of a little carbonate of lime, in order to neutralize the free acids, and then evaporated nearly to a syrupy consistence. By subsequent treatment with alcohol, the *scillin* was separated in the form of a syrupy liquid, which was removed from the supernatant layer by decantation, and purified by redissolving in water and again precipitating by alcohol.

The substance after successive treatment in the manner indicated, in order to remove all saccharine and mineral matters, was finally redissolved in a little water, and allowed to evaporate at a low temperature in vacuo. It was thus obtained in the form of a spongy, amorphous, yellowish-white mass, soluble in water in all proportions, but sparingly soluble in alcohol. Its aqueous solution was found to deviate to the left, and to possess no reducing action. It is not precipitated by neutral acetate of lead, and by the basic acetate only from concentrated solutions. Heated with nitric acid it forms no mucic acid, thus differing from gum, and is not precipitated by ferric salts, differing also from inulin by its free solubility in water.

By the action of dilute mineral acids the scillin was rapidly converted into a fermentable, strongly lævogyrate sugar, which was recognized as lævulose.

Submitted to elementary analysis, numbers were obtained approximating to the formula $C_{12}H_{10}O_{10}$, the deficiency in carbon found by the experiment being attributed to the small amount of inorganic matter which it still contained.

When dissolved in water it yielded with baryta-water a difficultly soluble barium salt, the analysis of which indicated the formula $(C_{12}H_{10}O_{10})_2BaO$, and which it is suggested may be utilized for the purification of the scillin.—*Journ. de Pharm. et de Chim.*, Oct., 1880.

(NOTE.—It would seem possible that the new substance described as scillin may prove to be identical with the *sinistrin* discovered by Schmiedeberg in 1879, and to have the formula $C_6H_{10}O_5$. The two substances agree in their amorphous character, non-reducing action and ready convertability into lævulose, although further comparative experiments would be necessary in order to prove their chemical identity.—
POWER.

On the Products of the Distillation of Colophony. By Ad. Renard.—The products of the distillation of colophony, submitted to repeated fractional distillation, and then washed with caustic soda in order to remove several acids of the fatty series, furnished among other products a hydrocarbon, boiling at 103° to 106° .

To obtain it pure, it was again washed with caustic soda, dried over chloride of calcium, then left a short time in contact with metallic sodium, and finally distilled over a fragment of that metal in a current of carbonic acid gas.

Upon analysis numbers were obtained which led to the formula C_7H_{12} , which was confirmed by a determination of its vapor density.

This hydrocarbon, which the author calls *Hepten*, is a colorless, mobile liquid, possessing a peculiar odor, and is soluble in alcohol and ether. Its density at 20° is 0.8031, and it is without action on polarized light.

When exposed to an atmosphere of oxygen, confined over mercury, it rapidly absorbs this gas, forming at the same time a very small quantity of carbonic acid gas.

It is without action on ammoniacal solutions of chloride of copper or nitrate of silver. Treated with chlorine it furnishes resinous products and disengages hydrochloric acid. Bromine acts upon it with violence

with the liberation of hydrobromic acid, but by allowing it to drop gradually upon the hydrocarbon, and allowing the mixture to remain in contact with an excess of bromine for two or three days in the dark, a thick liquid is obtained, which, after washing with an alkaline water in order to remove the excess of bromine, leaves a heavy, orange colored oil. The latter, treated with ether, furnishes a crystallizable bromated product, which may be purified by recrystallization from boiling ether, and the analysis of which leads to the formula $C_7H_8Br_6$. This body melts at 134° , and decomposes at about $150^\circ C.$ with the liberation of hydrobromic acid.

This body finally changes, by keeping, into an isomeric *hepten hexabromide*, which is an oily liquid.

Fuming nitric acid acts upon the hepten with great violence with the formation of resinous products. With nitric acid, sp. gr. 1.15, the action is slower, and does not commence until at about 80° , when it furnishes the ultimate products of the oxydation of organic matter.

Upon submitting to fractional distillation the products obtained at 200° to $250^\circ C.$ a hydrocarbon polymeric with the first-named, is obtained, boiling at 235° to 240° , and called by the author *Dihepten*, $C_{14}H_{24}$.

This hydrocarbon is very easily oxydized, and when exposed to the air becomes rapidly resinified. Exposed to an atmosphere of oxygen, confined over mercury, it absorbs this gas eight or ten times more rapidly than the hepten. Finally, the hepten is capable of uniting with the elements of water to form a crystalline hydrate, and which can be abundantly obtained by exposing for some time a small amount of the hydrocarbon, in contact with water, in loosely-stoppered vessels.—*Ibid.*, from *Ac. de Sc.*, 91, p. 419.

On the Presence of Vanillin in Crude Sugars.—The sugar which was employed for the purpose of analysis was obtained from a refinery in Bohemia. Two kilograms of the sugar furnished some drops of an oily liquid, possessing the strong aroma of the vanilla, and which it retained without alteration, even when exposed to the air for a month. From this liquid, by the proper treatment, a yellowish oil was obtained, which assumed a crystalline form after some time, but which, after being deprived of a yellow coloring matter, yielded finally but a very small amount of the pure substance. The substance, when pure, forms colorless stellate needles, possessing the decided odor and taste of vanilla. It is soluble in ether, alcohol, chloroform and naphtha,

less soluble in benzin and warm water, and very sparingly soluble in cold water. It melts at 80°C ., and its composition was found to accord with that of vanillin, $\text{C}_8\text{H}_8\text{O}_3$.

The vanillin is either formed through the influence of the lime, or liberated by that agent from a more complicated combination. It is also possible that the coloring matter plays a part in these reactions, but the nature of this substance is so little known that it is precluded from consideration. It is also the opinion of Mr. Stammer, who has devoted some study to this subject, that the cellular tissue takes part in the formation of the vanillin.—*Ibid*.

REMARKS ON THE TESTING OF MUSTARD OIL.

BY F. A. FLÜCKIGER.

The examination of a specimen of mustard oil, adulterated with bisulphide of carbon, which was performed at the request of Schimmel & Co. in Leipsic, led me to some observations, which may be connected with some communications of Hager ("Centralhalle," 1879, No. 39), on the subject of the same oil. (See also page 547.)

The adulteration was to such an extent, that, by heating the oil for one day in a water bath at a temperature not exceeding 80° , nearly one-fifth of the oil passed over, the distillate possessing very nearly the specific gravity of bisulphide of carbon, and, when warmed with alcohol and ammonia furnished very quickly the sulphocyanide of ammonium, which gave with ferric chloride the characteristic deep red coloration.

Treated in the manner indicated in my "Pharmaceutische Chemie," p. 42, with alcohol, caustic potassa and ether, the distillate above mentioned furnished the ethylxanthogenate of potassium, which was recognized by the beautiful yellow copper salt.

The liquid extracted from the mustard oil was, therefore, to be considered as bisulphide of carbon, although it was necessary to conduct the distillation at a temperature above 47° , in order to obtain approximately the entire amount.

The great mobility of sulphur in mustard oil has been known for a very long time, as may be seen, *e. g.*, from the statements to be found in Gmelin's "Handbuch der organischen Chemie," ii, 1852, p. 216.

It suffices, indeed, to warm pure mustard oil with a little alcohol and ammonia, and to remove the excess of the latter by heating in the

water bath, in order to obtain the sulphocyanide of ammonium. It follows herefrom that the sulphocyanide of iron reaction cannot be employed for the purpose of detecting bisulphide of carbon in mustard oil.

In order to obtain from pure mustard oil a metallic sulphide, probably always accompanied by sulphocyanide, it is not necessary to apply potassa, soda or ammonia; baryta water or lime water, even without alcohol, when warmed with mustard oil, accomplish the formation of the metallic sulphide, which may be detected by means of the nitroprusside of sodium. Even saturated solutions of carbonate of sodium are capable of extracting sulphur from mustard oil, forming therewith traces of sodium sulphide.

Mustard oil and ammonia combine to form thiosinammin, $\text{SCNH}(\text{C}_3\text{H}_5)\text{NH}_2$; 1 molecule of mustard oil = 99 gives 116 thiosinammin. 100 parts of mustard oil must therefore yield 117.7 parts of thiosinammin. I warmed 5 grams of the pure mustard oil, distilled by Schimmel & Co., with 2.5 grams of absolute alcohol, and 8.6 grams of ammonia water, sp. gr. 0.960, to about 60° , in a loosely stopped flask. After a quarter of an hour the mixture became clear, of a yellow color, and, at the expiration of an hour, the odor of the mustard oil had disappeared. Evaporated on a watch glass upon the water bath until no further considerable reduction in weight took place, the residue furnished upon cooling a white crystalline mass of thiosinammin, which, after drying completely over sulphuric acid, weighed 5.634 grams, or 11.2 per cent. of the applied mustard oil.

Other experiments, with slight deviation from this procedure, gave 11.1, 11.23 and 11.57 per cent. of thiosinammin.

Four grams of mustard oil, adulterated with bisulphide of carbon, furnished on the contrary only 3.6 per cent., *i. e.*, 90 per cent. of residue.

It is thus seen that the weighing of the thiosinammin, which can be obtained from a given specimen of mustard oil, is very well adapted for the determination of its value.

This very neat reaction is, however, accompanied by an unavoidable error. The action of the ammonia is, as one might expect, not confined to the formation of the thiosinammin, but the latter is always accompanied by some ammonium sulphocyanide. The amount of the latter is indeed very small, when a moderate heat and not much more ammonia is applied than is necessary according to the above formula.

It still remains to be studied under what conditions the formation of the sulphocyanide is most limited; presumably when the formation of the thiosinammin takes place in the cold, which in this case proceeds very slowly.

It would almost appear as if allylsulphocyanide, could be formed of itself in mustard oil which has been kept for a long time, for while pure and fresh mustard oil is not changed by alcoholic ferric chloride, I have occasionally observed with old mustard oil that a red coloration takes place upon the addition of ferric chloride. As is well known, allylsulphocyanide boils at 161° , and passes by simple distillation into mustard oil; it was therefore sought whether by the action of a high temperature the reverse reaction did not take place, and the mustard oil assume the property of becoming colored by ferric chloride. This was, however, by no means the case with a specimen of mustard oil which was heated in a sealed tube to 180° ; the oil became darker, but mixed, as before, without change with ferric chloride. On the contrary, the oil when exposed in a sealed tube for three weeks to the action of sunlight, assumed a darker color, showed on the tube a brown deposit, and was then colored red by ferric chloride. It remains a peculiar fact, that the red colored compound, which is formed by the action of ferric chloride on old mustard oil, or on that which has been changed by the action of sunlight, is insoluble in ether, which is not the case with the sulphocyanide of iron.

If one will employ the formation of the xanthogenate of potassium as a means for the detection of bisulphide of carbon in mustard oil, the question arises, whether the latter itself does not also take part in the reaction. This is indeed the case, and with pure mustard oil, which has been shaken with an alcoholic potassa solution, a liquid is obtained which may lead to a deceptive conclusion, as it also contains some potassium sulphide.

Indeed the behavior of the xanthogenate of potassium to copper salts is so characteristic that the smallest amounts of bisulphide of carbon can be thus recognized; but, if mustard oil be present at the same time, the decomposition products, proceeding from the latter, will also give darkly colored precipitates with copper salts. Dr. Bertram, of Schimmel & Co., has found that very dilute potassa, shaken for a very short time with mustard oil, does not furnish these deceptive products of decomposition. Such a solution is obtained, according to him, by saturating absolute alcohol with caustic potassa, and diluting 20 drops

of the solution with 10 cc. of alcohol. Ten drops of mustard oil, adulterated with bisulphide of carbon, shaken with the above potassa solution for *one minute*, then supersaturated with acetic acid, furnishes a liquid, which with a solution of sulphate of copper produces a reddish-yellow precipitate. Pure mustard oil, treated in the same manner, shows always an undesirable turbidity, and after some time also a whitish deposit, which, however, cannot be confused with that produced by bisulphide of carbon, but which does not exclude with certainty all doubts.

It is consequently the most desirable, under all circumstances, to distill off the bisulphide of carbon, when the quantity present will admit, and particularly to determine its specific gravity and boiling point. In the case now before us, the adulterated oil had the sp. gr. 1.073 at 20°, while the same, after the above described process of distillation, approached the correct number, 1.021, and the specific gravity of the distillate was increased to over 1.20.

By the long preservation of the questionable adulterated oil by the side of a specimen of the pure oil, the remarkable fact was shown, that the former in the course of a few months, even in dispersed light, became colored very dark brown, and the bottom and sides of the flask become covered with a dirty, brown-red deposit, while the pure oil under the same circumstances underwent no change. In exposed sunlight, however, such a remarkable distinction is not manifest, as in this case the pure oil becomes also dark colored very quickly.—*Pharm. Post*, No. 17, 1880.

F. B. P.

CHEMISTRY OF BAST FIBRES.

By E. J. BEVAN AND C. F. CROSS.

A Paper read before the Owens College Chemical Society, 16th April. Published by Plamer & Howe, Manchester. See also *Chem. News*, p. 42, '77.

The authors' investigations have been confined to jute and esparto, the former as a peculiarly typical bast fibre, the latter as representing monocotyledonous growth.

The *inorganic* constituents of the normal jute fibre are—

(a.) *Water of hydration*, varying from 10 to 12 per cent. of its weight, with the temperature and hygrometric state of the air. It is to be regarded as dependent both on the chemical nature and structure of the fibre (chemical adhesion), although scarcely upon its external structure (capillarity), as conjectured by Sir W. Thompson.

(b.) *Ash*.—The general features of the inorganic skeleton of this fibre may be expressed by the following average percentage numbers: SiO_2 , 30—35; Fe_2O_3 , 5—8; Al_2O_3 , 5—6; Mn_2O_3 , 0.5—0.9; CaO , 13—16; $\text{K}_2\text{O} + \text{Na}_2\text{O}$, 5—10; P_2O_5 , 8—13; SO_3 , 1—5.

(c.) *Organic* (considered with exclusion of *a* and *b*).—Combustions of the fibre (purified by boiling in dilute ammonia; the fibre thereby sustains a loss of 1 per cent. of its weight, losing a resinous constituent, which causes the adhesion of portions of cortical parenchyma and the matting together of the fibres in the raw state), showed it to have the following aggregate (average) composition: C, 46.5; H, 5.80 Nitrogen is present only in minute quantity, *e.g.*, in a fair specimen (previously boiled in dilute sodium carbonate) the quantity determined was 0.053 per cent. The proximate constituents of the fibre are, *cellulose*, 70 per cent., as isolated by the ordinary methods, and *intercellular and encrusting substance*, 30 per cent.

Hugo Müller's method for the quantitative determination of cellulose gives satisfactory results with this fibre; identical results are obtained, but in a very much shorter time by substituting *chlorine* gas for the bromine-water, the fibre being boiled previously to chlorination in a weak alkaline solution. The action of the gas is to form a definite compound with the aromatic portion of the fibre, which is decomposed on boiling with ammonia, with formation of soluble products. Pure cellulose is obtained on once repeating this treatment, whilst if bromine-water is used several repetitions (5 to 6) are necessary. A modification of this method, involving points discussed in another connection, consists in boiling the chlorinated fibre with a solution of sodium sulphite (5 per cent.) for a few minutes, and subsequently with an alkali (a solution of potash, 1 per cent., is a better solvent for the products of decomposition, and its use does not affect the yield of cellulose); by the method thus modified pure cellulose is at once obtained. It is a remarkable fact that the yield of cellulose is, in this case, 5 per cent. higher than by either of the two previous methods. There is additional evidence to show that jute cellulose is a chemical aggregate, and therefore to a certain extent defined by the process by which it is obtained. The above-mentioned chlorine derivative is a definite compound, $\text{C}_{10}\text{H}_{18}\text{Cl}_4\text{O}_9$; it has been obtained and purified in different ways, but with constant analytical results. It is soluble in alcohol and glacial acetic acid, and is precipitated from its solution on the addition of water, in yellow flocks; it dries to an amorphous yellowish powder, which

has an odor closely resembling that of tetrachloroquinone. It further resembles this compound in dissolving in ammonia to a purple solution, changing to brown on standing. The analogies of this body to the quinone derivatives are unmistakable; the authors are therefore able to confirm Hugo Müller's observation of the presence of a body having the reaction of a quinone in the intercellular substance of bast fibres. The most striking reaction of this derivative is the development of a pure Magenta purple color, of great brilliancy when treated with a solution of sodium sulphite. This is best seen in the freshly chlorinated fibre; all bast fibres examined by the authors (flax, hemp, manilla, etc.,) gave the same coloration after chlorination. Upon the reactions of these bodies the method for the isolation of cellulose proposed by the authors was based, the chlorine body being converted by the sodium sulphite into soluble (reduction) products. Being a recent observation it is still under investigation.

A similar derivative was obtained from esparto. The brown solution, obtained by heating the substance under pressure with an alkaline lye, yields a flocculent precipitate when neutralized. After purification by twice dissolving in glacial acetic acid, and reprecipitating by water, it has the aggregate composition $C_{21}H_{24}O_8$ (it contains also 1.2 per cent. nitrogen). This body, on heating with hydrochloric acid and potassium chlorate, yields the chlorine derivative, $C_{22}H_{23}Cl_4O_{10}$, which is also to be regarded as formed from a complicated quinone.

The quinone of the jute fibre appears to be associated with a carbohydrate. By the action of dilute sulphuric acid (5 per cent.) at 80° , a soluble carbohydrate is formed, and is obtained after purification as a brown, sticky, hygroscopic solid, having the composition $C_{12}H_{18}O_9$. As no other products are formed the aromatic portion of the fibre resisting the action of the acid, and the loss of weight (23 per cent. in a certain case) falling to a large extent on the intercellular substance, this, it must be inferred, contains a carbohydrate. The same conclusion is arrived at by a study of the action of alkalis on the fibre and of a peculiar fermentation, which is induced under certain conditions of moisture and high temperature by which this portion undergoes resolution. The carbohydrate, associated with the quinone, is rather of the nature of cellulose than glucose; the fact that by a certain decomposition of the intercellular substance the yield of cellulose is increased, goes to show that a portion of the "aggregate" cellulose obtained is a product of such decomposition. The authors therefore

regard the intercellular substance of this bast fibre as a "cellulide," or more specifically a celluloquinone. Upon this constituent depends the integrity and remarkable dyeing capacity of the fibre: *pari passu* with its removal these disappear until in the isolated cellulose there is obtained a mass of disintegrated cells, having no affinity for coloring matters.

By the action of nitric acid (5 per cent.) this celluloquinone is entirely converted into soluble products. The aromatic portion of these are more conveniently studied in the analogous esparto derivative. From the solution obtained by digesting the acid on the resinous precipitate before described, a peculiar nitro-derivative was obtained. Concordant analyses of this body, in the form both of its barium and calcium compound, established the formula as $C_{25}H_{31}NO_{25}M''_4$. In the free state it is a powerful acid; it has an intensely bitter taste, and dyes animal fibres a brilliant yellow.—*Jour. Chem. Soc.*, Sept., 1880, p. 667.

EMULSIONS.

BY A. W. GERRARD, F.C.S.

Demonstrator of Pharmacy and Materia Medica to University College.

This communication is the result of some experiments made with the view of determining what would prove the most valuable agents for general use to render oils, balsams, resins and oleo-resins in the form of emulsions. Also to arrange formulæ practical and reliable, for the most commonly prescribed substances required to be dispensed in the emulsion form.

The subject, I know, is one upon which much has been already said and written, and yet, withal, there exists amongst pharmacists a wide difference of opinion and practice as to the material or process which shall best emulsify any given oil. The truth of this observation may be demonstrated by giving the same prescription, say for $\frac{1}{2}$ an ounce of castor oil to be rendered into 2 ounces of emulsion, according to art, to six different chemists to prepare, the products will vary most astonishingly, no two being alike either in color or fluidity, and some not even emulsified at all. This want of uniformity in our art applies not only to emulsions, but various other preparations, and although some slight variations may be expected in preparations obtained from products themselves subject to natural variation, the difference is generally far too great to be explained on these grounds, and is often suffi-

cient to create suspicion or distrust in the mind of a patient, to whom no amount of explanation is satisfactory. This is matter for regret and enables me to make the observation that I believe the blame for much of this can be traced to a deficiency in pharmaceutical education, for it is a fact that actual practical pharmacy—I mean the real manufacture of preparations and practical use of apparatus—forms no part of the curriculum of our school. The remedy suggests itself.

The emulsifying agents most commonly employed and regarded with most favor are the mucilages of tragacanth and acacia, likewise their powders. My experiments have been confined to these substances, previous results having proven that where honey, yolk of egg and almond powder are recommended for special purposes, acacia or tragacanth answers equally well or better.

To decide the respective merits of tragacanth and acacia some forty experiments were conducted with each gum, both in powder and in mucilage, mixed with various oils and resins in various proportions, and by varied manipulation the results obtained being altogether in favor of powdered gum acacia, the emulsions it forms being perfect milk-like fluids, in which the eye cannot distinguish any particle of oil; they pour easily from the bottle and mix with water in any proportion without separation. Most of the forms given below have been kept for two months and show no deterioration.

For general instructions when using powdered gum acacia it is essential that it be of the best quality and almost white. The substance to be emulsified, if it be a fluid, must be measured in a dry measure and poured into a dry mortar; the necessary amount of powdered gum can now be well incorporated, next the portion of water indicated in each case, but by no means let it be measured in the oily measure. Now stir well, taking care that every particle of oil is brought within range of the disruptive mechanical motion; want of attention to this part of the operation is a frequent source of failure, for if any oil gets up the side of the pestle or mortar and is omitted from the emulsifying process it will most certainly show itself by floating upon the surface of the finished product, spoiling what might otherwise have been a perfect preparation.

When the substance to be emulsified is a solid or semi-solid body with resinous properties, it is advisable to dissolve it in twice its quantity of rectified spirit, then treat in the same manner as for fluids.

Syrups, tinctures and flavoring agents when ordered should, as a rule, be added last.

Emulsion of Codliver Oil.

Codliver oil,	4 ounces.
Essential oil of almonds,	4 minims.
Powdered gum acacia,	1 ounce.
Syrup,	1 "
Water,	to 8 ounces

Mix the gum with the oil, then place on the mixture 2 ounces of water and stir till the emulsion is formed, then add the remainder, water, essence and syrup.

Emulsion of Castor Oil.

Castor oil,	4 drachms.
Powdered gum acacia,	80 grains.
Essential oil of almonds,	1 minim.
Simple syrup,	2 drachms.
Water,	to 2 ounces.

Mix the powder with the oil, then add 2 drachms of water and stir till the emulsion is formed, add the remainder, water, syrup and essence.

Emulsion of Turpentine Oil.

Oil of turpentine,	4 drachms.
Powdered gum acacia,	2 "
Syrup,	2 "
Water,	to 2 ounces.

Mix the powder with the oil, add $\frac{1}{2}$ ounce of water and stir till the emulsion is formed, then add the remainder of the water and syrup.

Oil of turpentine is considered one of the most troublesome bodies to emulsify; prepared by this form there is no difficulty.

Emulsion of Balsam Copaiba.

Balsam of copaiba,	3 drachms.
Powdered gum acacia,	3 "
Simple syrup,	6 "
Water,	to 6 ounces.

Mix the powder with the balsam and add 6 drachms of water, then stir till the emulsion is formed, gradually add the remainder of the water and syrup.

Emulsion of Resin of Copaiba.

Resin of copaiba,	2 drachms.
Rectified spirit,	4 "
Powdered gum acacia,	4 "
Water,	to 6 ounces.

Dissolve the resin in the spirit, add the powdered gum and mix well, add now an ounce of water, stirring till the emulsion is formed; make up to 6 ounces with water.

Emulsion of Balsam of Peru.

Balsam of Peru,	.	.	.	.	3 drachms
Powdered gum acacia,	.	.	.	.	2 "
Simple syrup,	.	.	.	.	6 "
Water,	.	.	.	.	to 6 ounces.

Rub the powder well with the balsam, add 3 drachms of water and stir till the emulsion is perfect, then add the remaining water and syrup.

In emulsions containing resins or bodies heavier than water there is generally a sediment formed; it is so with the two previous forms, but there is no aggregation into a hardened mass, and a slight shake of the bottle puts all right again.

Emulsion of Chian Turpentine.

Chian turpentine,	.	.	.	.	2 drachms.
Ether,	.	.	.	.	4 "
Powdered gum acacia,	.	.	.	.	2 "
Water,	.	.	.	.	to 6 ounces.

Dissolve the turpentine in the ether and filter, washing the filter with a drachm of ether, mix well with the gum and add $\frac{1}{2}$ ounce of water, stirring till the emulsion is perfect, lastly add the remaining water.

Attention has already been called to the superiority of acacia over tragacanth to emulsify Chian turpentine, and the statement cannot be disproved.

Many of these forms have been well tested and practically made by large classes of students, and the results have been most satisfactory.

Before leaving the subject I will say that no rule of thumb practice should be attempted in making an emulsion; success may occasionally occur, but annoyance and waste of time and material is the invariable result.

In conclusion, powdered gum acacia in my hands has achieved the greatest success, and so far as I am concerned merits the distinction of being called the perfection of emulsifying agents.—*Pharm. Jour. and Trans.*, October 2, 1880.

THE RESTORATION OF DISCOLORED SYRUP OF
IODIDE OF IRON.

BY THOMAS B. GROVES, F.C.S.

Numberless articles by accredited writers in the "Pharmaceutical Journal" and elsewhere have shown that the preparation of a nearly colorless syrup of iodide of iron is not a difficult matter, and there has been a pretty general concurrence in the belief that the process of the British Pharmacopœia leaves little to be desired. As to its keeping properties, there has been and probably there still is a good deal of difference of opinion; some going so far as to say that it keeps perfectly well, and needs no special precaution for its preservation, whilst others have devised elaborate ways of bottling and storing or chemical treatment intended to enable the pharmacist to dispense a creditable article when called upon by the prescriber. It is doubtless true that when made with pure sugar, a substance by-the-by difficult at all times to procure, the syrup, when in reasonable demand, does keep fairly well, so well in fact that well accustomed dispensing establishments fail to see any difficulty in the matter. Such, however, is not the case with those who perhaps are not called upon to dispense the article once in a month, or even less frequently. Then on searching the cupboard it is often found that the syrup without *some* treatment is not presentable, and frequently it happens that for want of knowing what to do in the case the syrup is sacrificed and the patient incommoded. With the view of assisting my brother pharmacists when in this dilemma I venture to offer a few observations. I must, however, confess that instances have to my knowledge occurred where the pharmacist has not been too scrupulous, and ignoring the refinements of pharmacy has not hesitated to supply his customer with a discolored syrup. I have myself been hauled over the coals for supplying a colorless and comparatively flavorless article, "apparently not so strong as Mr. Dash's;" in fact have suffered for a time, as did George the First's cooks, who supplied his majesty's table with fresh oysters, "not so 'igh in flavor" as those to which his Hanoverian Highness had been accustomed.

The discoloration of syrup of iodide of iron is doubtless due mainly to the presence of free iodine; when turbidity is present there is probably also a basic persalt of iron in suspension which adds to the effect. To get rid of both of these it is only necessary to dilute the syrup with say a third of its volume of water, to boil briskly for a few minutes,

then filter through paper, and finally reduce by evaporation to its original bulk. The syrup will then have resumed its original appearance.

The strength of the preparation will not have been materially altered by this treatment, for it takes a wonderfully small quantity of iodine in the free state to color a large amount of liquid. Thus it will be found that one drop of liquor ferri perchloridi added to half a fluidounce of freshly prepared syrup of iodide of iron will produce in it the tint of golden sherry, to be completely dissipated by a few minutes' boiling. There is, I am aware, nothing new in this treatment by boiling, etc.; it has, I know, been mentioned already by some writer whose name I have unhappily forgotten, but whose useful though often unused suggestion has not escaped me.

I will now refer to some experiments I have recently made in the same direction, and having for their object the avoidance of the delay attendant on the process already mentioned.

The text-books tell us that when a persalt of iron is brought in contact with a soluble iodide, the salt is reduced to the proto condition, and free iodine is eliminated. It was at one time thought that under these circumstances a per-iodide was formed, but Mr. Squire, jr., some years since proved conclusively that such was not the case by showing that the color could be removed from such a liquid by simply shaking it with an ordinary solvent for iodine such as benzin or chloroform. If to such a liquid containing iodine in solution, caustic potash or soda be added, precipitation of ferric oxide will result, and the iodine will combine with the base of the precipitant. Applied to a discolored syrup of iodide of iron the process does not answer, and that in consequence of the sugar, as it appears to me, exercising a solvent action on the precipitated oxides. In fact it is after filtration more discolored than ever.

In a paper published in the ninth volume, second series, of the "Pharmaceutical Journal" ("Preservation of Syrup of Iodide of Iron"), I pointed out the effect produced by the presence in the syrup of a trace of phosphoric acid, how that by seizing at the moment of its formation the peroxide of iron and rendering it insoluble, it effectually prevented the reaction ending in the elimination of free iodine that would otherwise have resulted. Syrup, even dilute, will keep for years after being so treated, but of course one gets instead of the discoloration the slight turbidity occasioned by the deposit of perphosphate of iron; this however, being colorless and easy of removal by deposit or filtra-

tion, is of but little moment. Addition of phosphoric acid to syrup already discolored is of no avail; the mischief has been done and no persalt remains for it to act upon. If, however, previous to the addition of the acid, a few drops of liquor potassæ be stirred into the syrup the color disappears almost immediately, and, the acid being in slight excess, will not again return.

Thus I found by experiment that when to half a fluidounce of syrup discolored by one drop of liquor ferri perchloridi, I added enough liquor potassæ (the amount would vary according to the acidity of the syrup) to produce a distinct greenish coloration, the further addition of two drops of dilute phosphoric acid restored the syrup to its original tint.

The use of hyposulphite for this purpose is of course well known, but its employment is in my opinion not so recommendable as that I have just described.

The paper will, I fear, be regarded as simply hateful and utterly unorthodox by the few; but the many will, I hope, not be displeased to learn how of two evils to choose the least.—*Pharm. Jour. and Trans.*, Sept. 18, 1880.

IPECACUANHA WINE.

BY J. B. BARNES, F.C.S.

Upon looking over Dr. Dyce Duckworth's paper, read at an evening meeting of the Pharmaceutical Society in March, 1872, entitled "Notes on the Pharmacy of Ipecacuanha," it occurred to me that the wine might be improved by a modification of the plan proposed by Mr. Carteighe for the preparation of the acetum and the oxymel of ipecacuanha.

His prescription for the preparation of the acetum is to macerate an ounce of bruised ipecacuanha root in a fluidounce of acetic acid for 24 hours, pack in a percolator, and pour distilled water over it until one pint of percolate has been obtained.

The modification consists in evaporating the acetum thus obtained over a water-bath to dryness, and subsequent maceration of the dry extract in a pint of sherry wine for 48 hours, and filtration. By this means a rich brown solution is obtained, which, although made eight months since, has not thrown down the unsightly muddy sediment so well known to be the case when ipecacuanha wine of the Pharmacopœia is kept beyond a few weeks.

A white crystallized deposit of cream of tartar, however, made its appearance in about a fortnight, and the crystallization has gone on slowly ever since, but it differs very much from the muddy mixture of ipecacuanha of emetia and cream of tartar which continually goes on forming in the wine of the Pharmacopœia.

By this treatment the emetia is converted into the acetate, which, from its superior solubility, complete solution is insured.

It would of course be more rational to use an alcoholic solution of emetia, which Dr. Duckworth states has the same therapeutical effect as ipecacuanha, but similar effects would be obtained by the use of a liquid extract made by exhausting the acetic extract with water containing 10 or 15 per cent. of rectified spirit.

This new wine is slightly acid, but to so trifling an extent as to be not at all likely to interfere with the action of alkalies which may be prescribed with it.

A four fluidrachm dose proved an efficient emetic when given to an adult.—*Pharm. Journ. and Trans.*, Sept. 25, 1880.

NOTES ON PAPAW JUICE.

BY H. J. ROSE.

A casual paragraph, in a Jamaica paper, directed my attention, while in the island, to a statement that *Papaine* had been found to be a vegetable peptonizing agent. Without any available means of making experiments there, I brought up some of the juice, and the experiments since made confirm this statement, and even show that it acts also as a diastase.

M. Bouchut ("L'Opinion Médicale") gives as the result of his experiments, reported in full: "They prove that all organized tissues, even when they are living, may be peptonized by this substance, papaine, which is a vegetable pepsin. It acts upon the tissues of a living animal in the same manner as upon the albuminoid alimentary matters deposited in the stomach, or in a laboratory vase."

Dr. Peckolt ("Pharm. Jour. and Trans.," Nov. 1st and 15th, 1879, "Amer. Jour. Pharm.," Nov., 1879, p. 559) gives a full report of his analyses of the milk of the stem, leaves and green fruit of *Carica papaya*, made some ten years ago, during his residence in Brazil. The substance which he then isolated (by precipitation with absolute alcohol from a watery extract of the juice), *papayotin*, seems identical with

the *papaine* of M. E. Bouchut, and the results of recent experiments with it were that he found it dissolved an equal weight of roasted flesh or albumen.

The experiments which I have made on the effect of the juice on fibrin and albumen confirm the results of previous investigators; but I have also found that the dried juice possesses the property of converting starch into sugar, thus taking the part of diastase. I have not yet had time to follow up this subject, but, in the meantime, briefly indicate the experiments made, so that those who have more leisure may find ground for further research.

1. Five grains of starch was boiled in two fluidrachms of water, and, when cooled to 100°F., five grains papaw juice added, and the temperature maintained. In half an hour the solution was quite thin, and in an hour iodine no longer gave a blue coloration.

2 and 3. The same quantities were similarly treated with the addition respectively of 5 grains of glycerin and 5 minims of alcohol, with similar results.

4. Ten grains of starch, similarly treated, was decomposed by the same quantity, after a little longer action.

5. Fifteen grains nearly all decomposed under the same treatment.

6. Five grains starch, similarly treated, but allowed to cool, gave a similar result.

7. Five grains starch, similarly treated, with the addition of 3 minims of acid. hydrochlor. dil., showed but a slight action after three days.

In using any of the ordinary tests for sugar, the fact must be borne in mind that papaw juice itself contains saccharine matter, which must be determined before the conversion of the starch can be accurately ascertained.—*Canadian Pharm. Jour.*, Oct., 1880.

PAPAINÉ.¹

BY A. WURTZ.

In a former paper² the author described, in conjunction with Dr. Bouchut, a ferment which they had prepared by precipitating with alcohol the aqueous portion of the milky juice of *Carica papaya* after the formation of a coagulum, and to which they gave the name

¹ "Comptes Rendus," vol. xc, p. 1379.

² See "Pharmaceutical Journal" [3], vol. x, p. 283.

"papaine." It was at the same time stated that it appeared probable that a fresh quantity of papaine was formed by the action of water upon the coagulum. In the present paper M. Wurtz describes the experiments undertaken with the object of settling this and other points.

125 grams of papaw juice obtained by incision of the green fruit were filtered and the residue pressed. The solution precipitated by alcohol yielded 0.89 gram of a papaine very rich in ash, and containing—deduction being made of the ash—45.62 per cent. of carbon and 6.72 per cent. of hydrogen.

The pressed pulp was triturated in a mortar with 125 grams of water, and after twenty-four hours thrown upon a filter. The residue upon the filter was triturated with a fresh quantity of 90 grams of water. The two liquors, concentrated in a vacuum with the addition of a few drops of prussic acid, yielded 2.3 grams of papaine. After these two washings the pulp, already much reduced, was submitted to two fresh washings with water (first with 142 cc. and then with 150 cc.), and the liquors, united and concentrated in a vacuum, still yielded 1.1 gram of papaine, being a larger proportion than yielded by the original juice. This papaine, which digested fibrin energetically, contained (deduction being made for ash) carbon, 49.77, and hydrogen, 7.21 per cent. It therefore presented a composition differing from that of the ferment dissolved in the original juice.

After these four washings the white pulpy residue, not very much being left, was again digested with 50 cc. of water, and the water afterwards placed with 10 grams of moist fibrin. At the end of two days only 8 grams of fibrin remained, and the liquid, after filtration, was precipitated slightly by nitric acid; the fifth wash-water, therefore, still contained a small quantity of ferment. After these five washings there only remained 5 grams of moist pulp, representing 0.564 gram of dry matter. 2.5 grams of this pulp put to digest with 10 grams of moist fibrin at 50°C., left at the end of two days only 6 grams of moist fibrin, and the filtered liquid gave an abundant precipitate with nitric acid.

In another experiment 100 grams of juice obtained by incision of the fruit were suspended in water, forming a thick pulp, which was washed three times with water. The washings were added to the first liquor and the whole concentrated in a vacuum and precipitated by alcohol. The papaine (No. I.) so obtained, which was very white,

was analyzed. The pulp that remained upon the filter was suspended in a large quantity of water. After filtration the liquid concentrated in a vacuum yielded a fresh quantity of papaine (No. II.), which contained, as in the previous case, a larger quantity of carbon.¹

	I.	II.	Deductions made for ash.	
			I.	II.
Carbon,	42.21	44.18	46.90	48.55
Hydrogen,	6.28	6.28	6.99	6.90
Oxygen,	10.00	9.00	...	...

It is therefore demonstrated that the pulp, after being freed by washing from soluble ferment that may be adherent to it, still yields, by the action of water, a ferment capable of digesting fibrin. It may be recalled here that the gastric ferment appears to be contained under an insoluble form in the pepsiniferous glands, for these do not yield it to pure water.

The analyses, just quoted, show that the soluble ferment of *Carica papaya*, such as is obtained in precipitating by alcohol the aqueous solution containing it, is not of a constant composition. Numerous analyses of crude papaine have, in fact, given very divergent results in respect to the proportions of carbon and nitrogen, the carbon varying between 46 and 53 per cent. and the nitrogen between 14 and 18 per cent., deduction being made for ash. The proportion of ash varied also; generally it was high, amounting to 4 per cent. and even more; in one case it amounted to 20 per cent. It was ascertained that the ash consisted chiefly of phosphate of lime; it yielded soluble salt to water, and sulphuric acid and a small quantity of potash have been noticed.

It follows from the foregoing that alcohol precipitates from papaw juice, fresh or digested with water, a principle of variable composition. This would not be surprising, as the ferment might be mixed with other amorphous principles, especially with albuminoid substances, modified by its action, *i. e.*, peptones. These peptones being more dialysable than the ferment itself, it might be hoped that the ferment would concentrate on the dialyser. Experience has shown, in fact, that the residue from dialysis yields a ferment richer in carbon, and not containing more than 1 to 3 or 4 per cent. of ash. The following are some analyses of the ferment so purified. It may be remarked that the white

¹ Analyses of the pulp exhausted by water, alcohol and ether gave variable results. This residue still contained nitrogen.

precipitate, obtained by alcohol, was exhausted by ether, then dried in a vacuum at 75°.

Papaine, purified by dialysis, deduction made for ash.

Carbon,	.	.	50.77	51.80	50.70	52.77
Hydrogen,	.	.	7.23	6.71	7.50	7.47
Nitrogen,	.	.	...	...	...	15.17

These analyses show that the product purified by dialysis approaches in its composition that of albuminoid substances, and this analogy is strengthened by the fact that papaine contains rather a large proportion of sulphur, in two specimens there having been found 2.61 and 2.2 per cent respectively.¹

The preceding analyses presented too much divergence to allow of the conclusion that the product is definite and homogeneous. Another mode of purification was therefore attempted. Albumen and peptones being precipitated by subacetate of lead it was hoped to separate them by this reagent, which precipitates crude papaine incompletely. To such a solution, therefore, subacetate of lead was carefully added until a portion, after filtration no longer gave a precipitate. The precipitate was separated and a current of sulphuretted hydrogen passed into the filtrate. This was blackened, but the lead sulphide was not precipitated in flocks. To separate it the liquid was concentrated in a vacuum, and alcohol added to it drop by drop, so as to carry down the lead sulphide with the first portions of the papaine precipitated. The deposit having been separated by filtration the clear liquid yielded to alcohol a white precipitate of papaine. Two experiments made upon crude papaine from different sources yielded specimens of purified papaine, which after exhaustion with ether and drying at 75°C. in a vacuum, gave—deduction being made for ash—

	I.	II.	III.
Carbon,	52.36	52.19	52.9
Hydrogen,	7.37	7.12	...
Nitrogen,	16.94	16.40	16.44
Ash,	2.60	4.22	3.40

The sulphur was not estimated, sulphuretted hydrogen having been used during the operation. A third specimen contained 1 per cent. less of carbon, when submitted to dialysis during twenty-four hours it gave the figures stated under III.

¹ The experiments were made with products that had been submitted to lengthened dialysis and should not have retained any more sulphate, but the figures obtained require to be checked.

It may be added that 0.1 gram of specimen III. digested energetically 5 grams of moist fibrin, even after having been heated to 105°C.

M. Wurtz considers that the preceding analyses demonstrate that the digestive ferment of *Carica papaya*, named "papaine" by himself and M. Bouchut, possesses the composition of an albuminoid substance. To the characters previously attributed to this substance he adds the following, which relate to papaine purified by subacetate of lead.

It is very soluble in water, in which it is capable of dissolving in less than its own weight, after the manner of a gum. The solution, even when dilute, forms upon agitation an abundant froth. The crude papaine redissolved leaves sometimes an insoluble white residue.

Solution of papaine becomes turbid upon boiling, without coagulating like albumen. When left to itself during several days it also becomes turbid, and if then examined under a microscope is found to be full of vibriones and bacilla.

It gives an abundant precipitate with hydrochloric acid, and the precipitate dissolves readily in excess of the acid.

Nitric acid, added in small quantity, precipitates thick yellowish flocks that dissolve in excess of the acid.

Neither ordinary phosphoric acid nor acetic acid precipitate it, but metaphosphoric acid gives a plentiful precipitate.

Prussiate of potash added to acetic acid gives a precipitate.

Corrosive sublimate does not precipitate immediately the solution of pure papaine, or only gives a slight turbidity; after a time the turbidity becomes more apparent. Upon boiling an abundant flocculent precipitate is formed.

Plumbic subacetate does not give a precipitate, or only causes a slight turbidity, soluble in an excess of the reagent. If excess of potash be added to the liquor and it be heated it becomes blackened in consequence of the formation of sulphide of lead.

Sulphate of copper gives a violet precipitate, which becomes blue upon boiling and dissolves in potash with a beautiful blue color.

Chloride of platinum gives an abundant precipitate as also does tannic acid.

Picric acid gives an abundant precipitate insoluble in excess of the reagent.

Millon's reagent gives a plentiful yellowish-white precipitate that becomes brick-red when slightly heated.

These characters, as will be seen, are those of albuminoid matters, with some variations, especially in respect to corrosive sublimate and subacetate of lead.

In its action upon albuminoid matters papaine approaches the pancreatic ferment named "trypsin," by M. Kühne, who has made a careful study of it. Unlike pepsin, trypsin appears to approach the albuminoid matters; its action upon the latter appears to be more energetic than that of papaine. Papaine dissolves large quantities of fibrin rapidly, even in a neutral liquid; but to get a liquor that will not give a precipitate with nitric acid it is necessary to use a relatively large quantity of papaine—for example, 0.3 gram for 10 grams of moist fibrin—and to prolong the digestion at 50°C. during twenty-four hours. In this case there remains only an insignificant residue of dyspeptone, very rich in mineral matters, and the filtered solution gives with nitric acid only a slight turbidity, that may be due to an excess of the ferment. Moreover, in all these digestions, besides the bodies precipitable by nitric acid and by alcohol, there is formed a certain quantity of more hydrated peptones that are soluble in ordinary alcohol, especially with heat.

The rapidity with which solutions of papaine become filled with microbes induced M. Wurtz to ascertain whether they intervene in the rapid liquefaction of fibrin by this ferment, but he finds that nothing of the kind occurs.

The solution of fibrin by papaine takes place in the presence of prussic acid, boric acid, and even carbolic acid; that is to say, in conditions that exclude the formation of microbes.

In conclusion, M. Wurtz adds that he has separated from the juice of *Carica papaya* a fatty saponifiable substance and a crystallizable nitrogenous principle in white mamelons. These remain in solution in the liquor from which crude papaine has been precipitated. Further information on this subject will be given in a future paper.—*Pharm. Jour. and Trans.*, Aug. 14, 1880.

JAPANESE ISINGLASS.¹

This substance, known in China and Japan under the name of Tjintioiw, has been described by Hanbury² as occurring in two forms,

¹ Abstract of a paper by Dr. Leon Marchand in the "Bulletin de la Soc. Botanique de France" [2], i., 287.

² Hanbury, "Science Papers," 1876.

the one consisting of quadrangular sticks, from 1 to $1\frac{1}{2}$ inch in diameter and 11 inches long, and the other in slender furrowed strips, only $\frac{1}{8}$ of an inch in diameter. The first form appears to be the rarest in commerce, and is usually not so white and transparent as the second form, although this is not always the case.¹

With a view to determining the algæ which enter into the composition of this article specimens were submitted to microscopical examination, those pieces being chosen which, from their opacity or less transparent and clean appearance, indicated the probability of containing fragments of algæ in an unaltered state.

The following species were thus detected :

Streblonema.—Fragments of a species of this genus, consisting of articulated branched threads of a brown color, were found attached to a piece of *Gelidium*, but the fragment was too incomplete to determine the species.

Scytosiphon lomentarius, J. Ag.—A portion of this phæosporous alga, presenting a portion of the tubular frond, with the peculiar constriction characteristic of this species, was found.

Sporacanthus cristatus, Kütz.—This plant was represented by a little mass of branchlets, composed of a single row of cells and terminating in points; in some specimens cruciate tetraspores were found, the specimens corresponding well with Kützing's figure of the plant ("Tab. Phyc.," v., p. 24, t. lxxxii).

Ceramium.—The *débris* of algæ belonging to this genus were not rare, but the fragments met with were too incomplete to determine the species. One species, so far as can be judged from the presence of spines on the nodes, appeared to be *Ceramium ciliatum*, Kütz., l. c., "Tab. Phyc.," xii., p. 26, t. lxxxvi.

Centroceras clavulatum, Ag.—The specimen detected consisted only of two joints, but these presented such clearly defined characters that there could be no doubt the fragment belonged to the above-named species, since they exactly corresponded with Kützing's figure, l. c., xiii., p. 7, t. xviii.

Endocladia vernicata, J. Ag.—The *débris* of this alga was very rare. One of the filaments found exactly resembled that represented by M. Suringar ("Mus. Bot. de Leyde," vol. i, Algues de Japon, pl. xxx).

Gloiopeltis tenax, Turn.—Here and there in the jelly were found por-

¹ Specimens of this substance in laminæ have since been received from Japan, and contain the same algæ.

tions, not completely gelatinized, closely resembling this species, and the presence of ovoid cruciately-divided tetraspores exactly like those belonging to this plant confirmed the determination.

Gelidium polycladium, Kütz.—This was found in the form of fragments, often very well preserved, and distinguished from *Gloiopeltis* by the intricate character of the filaments, resembling Kützinger's figure of the plant, *l. c.*, tom. xix., p. 9, t. xxiv.

This species is frequently studded with the pretty diatom, *Arachnoidiscus ornatus*, Sur., which is abundantly met with in some specimens of Japan isinglass, and by the presence of which M. Menier detected the marine origin of some commercial currant jelly.

Nitophyllum?—Some portions presented a flat frond and hexagonal areolation, which recalled the structure of *Nitophyllum*. These, however, were found only in very small quantity, and in a badly preserved state.

Polysiphonia tapinocarpa, Sur.—This alga was met with in the form of little sections of filaments, consisting of short joints which, on transverse section, showed ten siphons, and I do not doubt belong to the above species, as figured in "*Algæ Japonicæ*," 1870, p. 37, pl. xxv., B. Some fragments of *Melobesia*? were found on this plant.

Polysiphonia fragilis, Sur.—This species is represented by Suringar on the same plate as the last, fig. A. It is distinguished from the last by showing only five tubes in the transverse section.

Polysiphonia parasitica, Grev.—This species has not apparently been yet found on the coast of Japan, but from the fragments possessing eight or nine siphons, and from other characters which were well preserved in the specimen examined, there can be but little doubt that they belong to the above species, as figured by Kütz., *l. c.*, xiii., p. 9, t. xxvi.

Diatomaceæ.—I have found a large number of species belonging to this group, but especially *Arachnoidiscus ornatus*, Ehr., described and represented by M. Suringar, "*Algæ Jap.*," fasc. iii., p. 5, pl. i., and by M. Menier.¹

The above are by no means the only species which enter into the composition of Japanese isinglass, but a large number of others, which were observed to be different, were too damaged to be recognizable. The two forms of the article seem to be made with the same algæ,

¹ C. Menier, "Falsification de la Gelée de Groseille du Commerce découverte par les Diatomées," Nantes, 1879.

so far as it is possible to judge from the species found in them, but with this difference, that in the quadrangular form *Gloiopeltis* seemed to be the chief ingredient, while in the slender sticks *Gelidium corneum* was most abundant. This, however, may not be the case in all samples. It seems probable that the Japanese and Chinese search their coasts for such algæ as furnish mucilaginous substances, and having collected them, do not trouble themselves to remove the parasites which are attached to them, or less gelatinous species which are entangled with them, and thus the quality of different specimens varies considerably. If the gathering consists almost entirely of *Gelidium*, *Gloiopeltis* and *Endocladia*, the transparency, whiteness and purity are very noticeable.

The name of Japanese isinglass, inasmuch as isinglass (*ichthyocolla*) means fish glue, is objectionable, and should not be retained. The name Agar-agar, which has by some writers been proposed for it, has no better claim, since it is applied to various algæ which are not known to enter into the composition of this substance.

According to Mertens ("Preussische Exped. nach Ost Asien, Die Tange," 1866, p. 140), the following species are employed in the East Indies, under the name of agar-agar: *Eucheuma spinosum*, J. Ag., *Sphaerococcus serra*, Kütz., *S. gelatinus*, Ag., *Gigartina horrida*, Harv., and at Timor, *Hypnea divaricata*, Grev.

The term gelose is also objectionable, on account of being applied to a definite chemical substance.

The name phycocolle or seaweed glue would be preferable, unless the name tjintiw or lo-thâ-ho be preserved.—*Pharm. Jour. and Trans*, Aug. 14, 1880.

CHIAN TURPENTINE.

BY WILLIAM MARTINDALE.

Since I published some notes on the above drug ("Pharm. Jour." [3], vol. x, p. 854)—which still is much in request, and until lately not to be had in the market, although some of the genuine article is now offered at a high price—I have received the following account of it, and the probable supply this season, from M. D. Spadavo, French Consul at Chio. The account tallies pretty well with that which I published before, and the supply, although not large this year, could, if required, be much increased.

"I am happy to give you the information you require relating to Chian turpentine. This drug has not been collected in our island for

many years, and I believe the greatest quantities of Chian turpentine sold as such in England were mere falsifications or another kind substituted for it. Chio may possess about 1000 turpentine trees, some exceedingly old—up to eight hundred or nine hundred years—and varying from $\frac{1}{2}$ yard to 10 and 12 yards in circumference. These trees when well cultivated may give from 2 to 3 kilograms of turpentine (a year?).

“The turpentine is collected by incisions made in the trunk of the tree about April, which are renewed every year.

“The fruit of this tree when ripe is collected and pressed in the same way as the olives; it gives a magnificent oil, very much liked by the inhabitants and often employed instead of butter. As soon as the fruit begins to get ripe the flow of the turpentine ceases. This happens about the middle of August.

“This year the inhabitants have been surprised to receive orders for the collection of turpentine, as it has been asked for in England and bought at the rate of 6s. the oke (or 1600 grams). The island has not produced over 700 or 800 kilograms this year, as many have not been informed in time to incise the tree. Owing to its cheapness the possessors of these trees do not give themselves too much trouble in collecting it clear, and they let it flow on the sand, which is taken with it. We have not the means to get it cleared and are obliged to send it as it is collected.”

The above is dated, “Chio, 18th September, 1880.”—*Pharm. Jour. and Trans.*, Oct. 2, 1880.

VARIETIES.

Tonic Glycerin.—Dr. Larmaude finds the following an excellent substitute for codliver oil with patients who cannot take that remedy: Pure glycerin, 300 grams; tincture of iodine, 30 drops; iodide of potassium, 30 centigrams. A tablespoonful a quarter of an hour before each meal. The appetite soon returns, and constipation, when present, soon disappears. For children and delicate persons, he employs 50 grams of syrup of raspberry and 250 of glycerin.—*Rev. Méd.*, April 3, from *Med. Times and Gaz.*, April 24, 1880.

An Improved Nitrate of Silver Caustic.—A writer in the “Medical Times and Gazette,” Dr. Sawostizki, has called the attention of the Moscow Surgical Society to an improvement in the preparation of sticks of nitrate of silver. It con-

sists in melting together 5 parts of nitrate of silver with 1 part of nitrate of lead, forming an argentum plumbo-nitricum. Sticks formed of this are preferable to those of the ordinary nitrate, as they are not easily broken, and can be pointed just like a lead pencil.—*Medical and Surgical Reporter*, from *Ibid*.

Oil of Mustard in Malarial Fever.—Haberkörn ("London Medical Record") has very successfully used the ethereal oil of mustard, on account of its anti-bacterial properties, in the pernicious fevers of malaria. He gives two or three drops a day in a great quantity of distilled water; or better, from two to four drops in a ten per cent. alcohol solution. His results have been "most remarkable."—*Louisville Med. News*, June 3, 1880.

An Innocent Powder for clarifying and partially decolorizing wines, liquors, vinegar, etc., is made by Dassori by mixing 30 kilograms albumen, 300 grams neutral potassium tartrate, 500 grams alum and 70 kilograms ammonium chloride, and is used like albumen, 60 grams of the mixture being sufficient for 2 hectoliters; it ought to be first beaten carefully with cold water, but never directly with the liquid to be clarified. The liquids thus clarified never become turbid again.—*Pharm. Centralh.*, December 25, 1879, p. 479, from *Chem. Ztg.*

A very Concentrated and at the same time mild Soap, particularly well adapted for washing fine fabrics having a delicate color, is made by rasping ordinary soap into very fine shavings (as fine as sawdust), drying the latter on wire screens placed in a warm place, grinding into a fine powder and pressing this, either directly without any addition, by very strong pressure into bars, or adding to the powder sufficient ox gall to make a solid mass, which is then shaped into bars like ordinary soap. If ox gall is added, it must be previously beaten into a uniform mass.—*Pharm. Centralh.*, December 25, 1879, p. 479, from *B. Polyt. Notizbl.*

Oleoresin of Male Fern is considered a harmless tapeworm remedy by many practitioners, while others believe it to be too powerful for delicate constitutions (see "Amer. Jour. Pharm.," Dec., 1879, p. 598). Dr. Pfeifer administers successfully, in nine cases out of ten, the following:

R	Extr. fil. maris æth.,	.	.	.	.	.	.	2 drs.
	Mucil. gum acaciæ,	.	.	.	.	.	.	q. s.
	Aquæ cinnamomi,	.	.	.	.	.	.	5 ozs.
	Syr. aurantii corticis,	.	.	.	.	.	.	1 oz.
M. D. S. To be taken in three doses.								

Dr. v. Hauff also claims successful removal of tænia by administering it, while Dr. Erlenmeyer reports a very unsuccessful treatment, resulting in removal of the tænia without its head, followed by strong nausea, vomiting, diarrhoea, fever, fainting, diaphoresis and intestinal catarrh, lasting for over six weeks.—*Pharm. Ztg.*, Nov. 26, 1879, p. 734, from *Wuertt. Med. Corr. Bl.*

Pilocarpin in Asthma.—Berkart recommends the administration of pilocarpin in attacks of asthma. "The powerful revolution which pilocarpin produces in the

distribution of the blood must necessarily have a very beneficent influence in some forms of asthma; for, by attracting a large volume of blood to the skin and to the salivary glands, and by diminishing its volume through the copious perspiration and salivation, the congested internal organs are relieved in a corresponding degree."

Within a few minutes there is marked improvement both in subjective symptoms and physical signs. Alarming symptoms may be developed in cases where there is fatty degeneration of the heart, but these will soon subside spontaneously, or may be relieved at once by a subcutaneous injection of 1-120th or 1-60th grain of atropin. The dose of pilocarpin should not exceed one third of a grain. Berkart never gives more than 10 drops of a 2 per cent. solution. During the action of the drug the patient should preserve the recumbent posture—which the almost immediate relief will enable him to do—and he should be carefully watched until the effect has passed off. It is well also not to use pilocarpin soon after the patient's meals.—*Brit. Med. Journ.*, June 19, 1880, from *St. Louis Courier of Med. and Collat. Sci.*, July, 1880.

To Preserve and Renovate Rubber Instruments.—It is well known that many articles and instruments made of rubber are apt to become dry with time, and to crack, grow brittle and lose all elasticity. According to a Russian journal, this may be prevented by the use of a simple mixture of 1 part aqua ammoniæ with 2 parts of water, in which the articles should be immersed for a length of time, varying from a few minutes to one half or one hour, until they resume their former elasticity, smoothness and softness.—*The Druggist*.

How Nature Moulds her Living Forms.—What does the story of life upon the earth teach us concerning the unfoldment of organic form? Is the human figure a chance result of an evolutionary force which might have pursued some quite different direction; or are the laws of development such as to lead inevitably toward the form of man as their highest organic product? This is a question admitting of a more definite answer than may at first thought appear, as we hope to show by a rapid survey of the various steps of the process.

And, first, it must be borne in mind that Nature's efforts at animal and plant formation have been on no contracted scale. The varying forms produced have been almost multitudinous. They exist at present in the greatest variety. But the present is only the apex of a long succession of life-epochs, each with its special organic group. We must multiply the existing forms for thousands of such epochs to obtain any adequate idea of the whole broad field of life. Plainly, then, Nature has not dealt sparsely with the subject, but has produced a most generous profusion of differing forms. Hence, narrow as is the field of the earth, there is reason to believe that the form-evolving principle has had full opportunity here to act, and that it has selected out the most favorable line of development from the many directions attempted.

Life is an incessant battle—a battle for food, and a battle for safety. The total quantity of food is limited. The powers of organic increase are unlimited. Thus a fight for food becomes necessary; a conflict in which no quarter is asked and none given. Victory inclines to the strongest and best armed. The successful combatant must have powers of defence against all Nature's attacks, and of assault against all Nature's defences. In other words, the organism best adapted to its environment will win.—CHARLES MORRIS in *Popular Science Monthly* for November.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, October 19, 1880.

The meeting was called to order by the president, Dillwyn Parrish. This being the first meeting of the series an election of a Registrar was ordered, when, on motion of Prof. Sadtler, T. S. Wiegand was re-elected.

The minutes of the last meeting, held in May, having been read and no objections being made thereto they were approved.

Prof. Remington, on behalf of Dr. Manlius Smith, of New York, presented to the College, for the cabinet, a specimen of the unripe fruit of the *Conium maculatum*, which is being recommended for exclusive adoption in the new edition of the United States Pharmacopœia, and also a specimen of *Veratrum viride*. The thanks of the College were directed to be returned for the same.

Mr. W. B. Webb stated as a matter of experience with the method of *preparing cerates*, noted in the minutes of the last pharmaceutical meeting, that he had failed to obtain as good results by the process as with that which is now official.

Dr. F. B. Power exhibited three specimens of the oil of *Asarum canadense*, one by Schimmel & Co. of Leipsic, Germany, one by Dr. Squibb and one distilled by himself. This oil is now made quite largely for perfumers' purposes, in soap making, flavoring tooth washes, and said also to be one of the constituents of Hoyt's German Cologne. By fractional distillation it is separated into several distinct portions, that coming at the lowest temperature being isomeric with oil of turpentine and the next having the composition of Borneo camphor. That which is fractioned at the highest temperature is at first of an intensely blue color and is doubtless quite complex in composition.

Dr. Power also exhibited some specimens of the liquid constituents of oil of peppermint. The odor is due entirely to the menthol camphor.

In this connection Prof. Sadtler stated that in a recent chemical journal an account of a dispute relative to some *oil of mustard* was noticed. Messrs. Schimmel & Co., having purchased a quantity of it, found, upon transferring it to other packages, some of it exploded, and examination proved that carbon bisulphide was present largely. This induced reclamation upon the part of Schimmel, as a fraud had been perpetrated. In reply it was alleged that the oil was obtained by using the seed of the *Sinapis juncea*, and not the *S. nigra*.

Experiments made by Prof. Hoffmann, to whom the matter was referred, as a chemical expert, showed that all oil of mustard, whether made artificially or extracted from any of the varieties of *Sinapis*, contained carbon bisulphide, but in such small proportion as to be immaterial, while the large amount contained in the oil in question was doubtless put there as an adulteration.

Dr. Power stated that he had seen some of this oil, which had been sent to Prof. Flückiger for examination, and that the conclusion Prof. F. arrived at was that distillation was the only reliable means of determining the quality of such oil.

Prof. Maisch gave the meeting an account of many of the places he had visited while in Europe, stating that, his object having been rest and recreation, he had not charged himself with sight-seeing as much as he would have done had he gone abroad for a different reason. He had visited a number of pharmaceutical schools.

and many prominent pharmacists and chemists in England, Holland, Belgium, Germany and Switzerland, and briefly described the institutions he had visited. He also exhibited an elastic bandage, woven like hosiery, which is extensively used in Europe, and a small mill for grinding pepper as wanted at meals.

There being no further business, on motion, adjourned.

T. S. WIEGAND, Registrar.

EDITORIAL DEPARTMENT.

The next number of the Journal, as we have previously informed our readers, will contain besides the index of the present volume also the general index of the last ten volumes; its preparation involves a great deal of labor, and, although much of the work has been done, it is likely that the appearance of the December number may be delayed for a few days, for which we ask the kind indulgence of our friends.

Philadelphia College of Pharmacy.—The following extract from the minutes of the meeting, held September 27, 1880, was accidentally omitted in our last issue: The following gentlemen were elected to serve as *trustees for three years*, viz: Messrs. Alonzo Robbins, E. M. Boring, William McIntyre; and a *committee on deceased members*, consisting of three members, was also elected to serve for *one year*, as follows: Messrs. Charles Bullock, Joseph P. Remington, Alfred B. Taylor.

Colleges of Pharmacy.—The courses of lectures have begun last month, and as far as we have learned there is a goodly attendance at all pharmaceutical colleges.

In the *Philadelphia College of Pharmacy* it was found necessary to increase the number of working tables in the chemical laboratory from 32 to 48; Fred. B. Power, Ph.G., a graduate of the class 1873—74, and lately of the University of Strassburg, has taken the position of assistant to the superintendent of the laboratory.

In the *New York College of Pharmacy* the museum has, through the liberality of Mr. A. C. Dung, been enriched with a valuable collection of cinchona barks, formerly in the cabinet of Dr. Martiny of Darmstadt. The library has also received several valuable additions.

Physicians and Pharmacists in Council.—An adjourned meeting of physicians and pharmacists was held at the Philadelphia College of Pharmacy, October 1, Dr. Stubbs in the chair, and Dr. Stretch acting as secretary. The subject of discussion was the *renewal of prescriptions*. In the lengthy discussion we fail to find any new argument. On the one side it was contended that the physician charges a professional fee, but does not sell the prescription; that serious results, and even death, had taken place in consequence of unauthorized renewals, and finally, as stated by Dr. Butcher, that in consequence of pecuniary losses to physicians they object to the miscellaneous renewals of their prescriptions. On the other hand it was held, that pharmacists cannot stop the public from the privilege of having prescriptions

renewed, but that the physician should educate the patient up to the point that it is unsafe to take medicine without the physician's orders.

On motion of Mr. Blair, amended by Dr. Butcher, it was

Resolved, That physicians, when writing a prescription which they do not wish renewed, should *write* on the bottom of such prescription "Do not renew," and also inform the patient of the fact in every case; and on the other hand, the druggist should either *write or print* on the label upon the bottle or package "Not to be renewed unless by a written order of the doctor."

We are glad that this plan has been agreed upon; but whether it will work the desired reform we are inclined to doubt. By long usage the patient has a right to a copy of the prescription, and if he demands it, even to the original. This was alluded to in the discussion and an amendment was offered "that no copy be furnished," but was afterwards withdrawn. However, even if it had been adopted, there is nothing to prevent the patient from taking a copy of the prescription, instead of the original, to the drug store. That the subject is not easily settled by passing resolutions was felt by some of the speakers who suggested its settlement by a suit in equity or by legislative enactment.

The adoption of a "medical and pharmaceutical code for mutual observance by which the legitimate province of pharmacy and the professional rights of physicians shall be secured" was repeatedly alluded to, and Dr. Prall thought that this would overcome the difficulties, and that then druggists could always discourage renewals as a duty, especially when the ingredients were injurious to be taken for any length of time. We submit that there is a vast difference between *discouraging* and *refusing* renewals, and that in the cases cited conscientious pharmacists regard it as their duty to caution the patients against the injury likely to result from the continued use of dangerous drugs.

At the adjourned meeting, held October 8, the subject of discussion was *counter prescribing*. Besides the difficulty of exactly defining what is meant by "prescribing over the counter," and how far the pharmacist is justified in expressing an opinion as to the choice of simple remedies, the discussion did not bring forth any new points. On the part of the physicians charges were made, while the pharmacists present denied the same applying to them; evidently the advice in our last issue, not to burden on either profession the misdoings of some of its members, was not heeded. Attention was called to the code of ethics of the Philadelphia College of Pharmacy, and on motion of Professor Remington the following resolution was adopted:

Resolved, That as the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the pharmacist for these responsible offices, he should, where it is practicable, refer applicants for medical aid to a regular physician.

The Philadelphia pharmacy law was then alluded to, and it was stated that, if faithfully carried out, it would prevent the sale of drugs and poisons by incompetent men. The hope was expressed that the time might not be far off when it would be settled for the public who are competent physicians; a bill to that end would be presented to the next legislature.

Motions were made and carried requesting the editor of the "American Journal of Pharmacy" to publish a brief report of these meetings; thanking Professor Reming-

ton for his kindness evinced during the discussions, and thanking Dr. Stretch for his faithful services as Secretary.

Although we do not believe that the questions discussed have been settled to the satisfaction of *all* interested, yet we do believe that much good would come from a more frequent intercourse of physicians and pharmacists. It need not be grievances or crinations to bring them together; there are so many scientific and practical points on which the members of one profession might enlighten the other, that we feel sure such meetings might also be made interesting to the attendants.

A Bogus Medical Institution.—On page 235 of our April number a list of so-called colleges and universities has been published whose diplomas have been issued for a money consideration, and without requiring the tedious course of acquiring knowledge through systematic instruction. To this list must now be added the "Washington Medical Institute," incorporated under an act of Congress passed in 1870, which provides that any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District of Columbia, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious or missionary purposes, may make, sign and acknowledge before any officer authorized to take acknowledgement of deeds in the District, and file in the office of the Recorder of Deeds a certificate setting forth the objects for which the society is formed, and the name or title by which such society shall be known in law, as well as the particular business it purposes to transact. Upon filing their certificate, the persons shall be a body politic and corporate, and they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents.

The New York "Herald" of October 23d gives a history of the concern referred to, which commenced with the filing, at the City Hall, Washington, D.C., on Nov. 16, 1874, of the following articles of incorporation, duly acknowledged on the day mentioned before Chas. Con. Callan, Notary Public. The document is worded as follows:

Be it known that under and by virtue of the provisions of Section 3 of an act of Congress approved May 5, 1870, entitled "An act to provide for the creation of corporations in the District of Columbia by general law," the undersigned citizens of the United States have constituted themselves a body corporate under the name and title of "The Washington Medical Institute of the District of Columbia," whose object and purpose is to provide the public protection against medical charlatany in every form; to disseminate knowledge throughout the United States by a series of lectures, both public and private, and to provide for the treatment of all diseases. The trustees, to whom shall be confided the management of the affairs of said institute, shall be four in number, and shall consist of John E. Smith, M.D.; Seldon W. Crow, M.D.; Oscar C. Stout, M.D., and B. Brown Williams, M.D., from whom the officers of such institute shall be elected for the first year of the existence of said institute.

JOHN E. SMITH, M.D.,
SELDON W. CROW, M.D.,
OSCAR C. STOUT, M.D.,
B. B. WILLIAMS, M.D., *et al.*

It will be observed that no authority is claimed for conferring degrees, nor could

such be done under the law cited above, by which medical colleges are held to be institutions of learning, and as such the incorporators are responsible to the authorities of the district, and are empowered to confer degrees, and are annually required to file with the Recorder of Deeds a statement of the trustees and officers of the institution. But the fact of being legally incorporated would seem to be quite sufficient for assuming the responsibility of issuing diplomas.

The name of neither of the four corporators appears on the list of medical practitioners of Washington, and only Smith and Crow seem to have resided there for some time; the latter claims to be a graduate of the Jefferson Medical College of Philadelphia and of the National Medical College of Washington. The building No. 215 Twelfth st., southwest, where this institute claimed to be located in 1875, is at the present time a tenement house.

The New York "Herald" publishes also a letter addressed to a New York physician, offering to the latter a diploma for \$25; but it is likely that in most cases the "Institute" offered its sheepskins to quacks and to those whom the "Dean" supposed to be quacks. We have heard of two other cases precisely analogous to the following.

On August 29, the following printed postal card was mailed in New York:

TAKE NOTICE.

By Act of Legislature, State of New York, Sec. 2, You Dr. R. . . . are required to Register in the County Clerk's Office, City Hall, New York City, your Name, Residence and Place of Birth, with your authority for Practising Medicine, Surgery, Mid-wifery or any branch thereof by Electricity, Magnetism or otherwise, before the First day of October, 1880, under penalty of fine and imprisonment. No further Notice will be given.

By order of the Association for the Suppression of Quackery.

The postal card was addressed to a member (not a physician) of a respectable mercantile firm who have been advertising a beverage under the name of orange tonica, which doubtless attracted the attention of the enterprising "Institute," and the above card was merely sent as a precursor to a subsequent offer. There is no society, having the above title, in New York, and the handwriting of the address and name in the card, though disguised, evidently resembles the handwriting in a letter which was likewise addressed to "Dr. R. . . .," and was mailed in Washington, D. C., on the morning of September 18. The following is a copy of the letter, the italicized heading being printed in the original:

*Washington Medical Institute.
Incorporated November 16, 1874.
Act of Congress May 5, 1870*

Post Office Box 221.

Washington, D. C., September 17, 1880.

Doctor:—Should you desire to procure a diploma which will enable you to practice in any part of the world, you can procure one for \$25 from the Washington Medical Institute. If you wish one send name, age, address and number of years in business and the Dean of the faculty will call upon you and examine you and confer degrees as provided by Act of Congress.

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Further comment is unnecessary. That the charter of that "Institute" is legally forfeited there can be no doubt, and it is to be hoped that the proper authorities so

declare it. But whether Dr. Crow, who seems to be the leading man in this concern, and his co-partners are not also criminally liable for using the U. S. mail for fraudulent purposes, is a question well worthy the consideration of the Postmaster General.

Correction.—On page 517 the figures, to which attention was called by a foot-note, should be changed from 48 to 24 *troyounces of sugar*.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Qualitative Chemical Analysis. By Silas H. Douglas, M.A., M. D., and by Albert B. Prescott, M.D., F.C.S. Third edition, wholly revised. New York: D. Van Nostrand, 1880. 8vo, pp. 305.

The work is intended as a guide in the practical study of chemistry and in the work of analysis, and occupies a prominent place among works of similar aim for thoroughness and reliability. After an introductory chapter on notation, atomic weights and general advisory remarks on analysis, Part I treats of the metals in four groups, Part II of the non-metals and the acids, and Part III on systematic examinations. A very interesting and valuable addition is the chapter (Part IV) on a study of oxidation and reduction. The concluding pages are occupied by tables of solubilities and of reagents, and by a very full index. The work well deserves the attention of teachers and students of analytical chemistry.

Grundlagen zur Beurtheilung des Trinkwassers, zugleich mit Berücksichtigung der Brauchbarkeit für gewerbliche Zwecke und der Reinigung von Abfallwasser, nebst Anleitung zur Prüfung des Wassers. Von Dr. E. Reichardt, Professor in Jena. Halle. Buchhandlung des Waisenhauses, 1880. 8vo, pp. 170.

Principles for the valuation of drink-water, also in regard to the fitness for industrial purposes and the purification of waste-water, with a guide to the examination of water.

The title indicates the aim and object of the book before us. The fact that the publication of a fourth edition has been rendered necessary is a sign that it has been found useful and is appreciated. The science of public health is continually attracting more attention. Water is a necessary agent for the existence of man and of other organized beings, and the preservation of man's health depends to a very considerable extent upon the purity of the water consumed by drinking, in cooking, etc. That sewage and other contaminations of water are apt to produce serious epidemics cannot be denied, as the experience of certain sections of our own country abundantly proves. It is, therefore, a matter for congratulation that the examination of water has received much attention during the past years.

The work before us is based upon a large number of investigations, undertaken with the view of determining the fitness of various waters for the use of man. It offers numerous suggestions and discusses all kinds of conditions, which have of late years attracted attention as bearing upon this important question, and since the

author has critically sifted the various methods proposed, it will be found a reliable guide for the purposes indicated in the title. The addition of thirty-three good wood cuts and of two lithographic plates of various diatomaceæ enhances the usefulness of the work for the object intended.

American Newspaper Directory, containing accurate lists of all the lists and periodicals published in the United States, Territories and the Dominion of Canada, together with a description of the towns and cities in which they are published. New York: Geo. P. Rowell & Co., 1880. 8vo.

The twelfth annual issue of this directory now before us is perhaps even more elaborate than those of its predecessors which we have seen and favorably commented upon heretofore. We believe it to contain the best and most reliable collection of facts concerning the periodicals of North America. It is a volume of over 1,000 pages, one half of which is occupied by the directory proper.

Brief Longhand. By Andrew J. Graham. New York (Bible House). Pp. 84. Price, bound, 63 cents.

The long title of this little book states that it contains a system of longhand contractions, by means of which the principal advantages of shorthand are secured without resort to stenographic characters and with perfect legibility. It is methodically arranged and is furnished with ample illustrations, and with keys to the exercises, and contains also, remarks upon the means of acquiring ease and correctness in composition, directions for correcting the press, for keeping a common-place book and index rerum, etc. The system of brief longhand recommended cannot fail but be useful and time-saving to those who are in the habit of taking notes and making memoranda, and as it is easily acquired and read without difficulty, commends itself favorably to all, the more so since after it has been mastered it may be very readily used in combination with phonographic signs.

The Art of Prolonging Life. By Christopher William Hufeland. Edited by Erasmus Wilson, M.D. Philadelphia: Lindsay & Blakiston. 12mo, pp. 298. Price \$1.

Most of our readers have probably heard of this work which is known also under the title of "Macrobiotic," and was published by Hufeland nearly a hundred years ago. It has been translated into most modern languages, and since the advice on diet and general hygiene has deservedly gained for it great popularity, this new edition, which is essentially the English translation first published in 1797, will doubtless be read here by many who appreciate the value of sound health.

Handbuch der Botanik. Von Prof. Dr. N. J. C. Müller. I Band: Allgemeine Botanik. I Theil: Anatomie und Physiologie der Gewächse. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1880. 8vo, pp. 648.

Handbook of Botany. Vol. I, General Botany. Part I, Anatomy and Physiology of Plants.

The author, who is Professor of Botany at the Academy of Forestry at Mün-

den, presents here the first part of a work which, if continued and finished with the same care that has been bestowed upon this book, will be a very important and most valuable one, inasmuch as it aims to give not merely the facts as ascertained by indefatigable investigators, but furnishes, likewise, the proofs together with the methods followed for investigation. The microscope and polariscope are most valuable agents for discerning the structure and observing the histological and chemical changes in plant-life; but certain effects and processes are demonstrable also by physical experiments, and these, as a rule, are very clearly described and where necessary illustrated.

The work is divided into ten chapters, treating of protoplasm, cell formation, phenomena of growth of the membrane, growth of membranes and elongation of organs, results of growth of membranes, causes of changes in direction and position, coarse anatomy, theory of the nutrition of plants, influence of heat and retrograde decompositions, including disease, fermentation, decay and putrefaction. The subjects are very fully illustrated by nearly 500 good wood cuts, a number of which have been printed in several colors. The botanist desiring to familiarize himself with the scientific investigations on plant life under the most varying conditions will find this a very excellent work instructive as well as suggestive of further experimentation.

Das Protoplasma als Träger der pflanzlichen und thierischen Lebensverrichtungen.
Von Dr. Joh. von Hanstein. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1880. Pp. 188.

Protoplasm as the sustainer of the vegetable and animal vital functions.

The author, recently deceased, was Professor of Botany at the University of Bonn and well known for his numerous scientific investigations in the various branches of botany. The work before us has for its object the sifting of facts and observations in regard to the sources of the vital force peculiar to the living beings and discusses, first, the development and activity of the minute elementary parts of all organisms, the cells, which must be regarded as the seat of vital activity. The second part is devoted to the origin of protoplasm and its functions in the living cell, and it is shown that the cell and protoplasm together are necessary to produce any and all manifestations of life in the most simple individuals of protococcus and allied beings as well as in the most perfect ones known. The diction of the essay is clear and entertaining, so that the subjects discussed are readily comprehended also by others than professional botanists.

Forschungen auf dem Gebiete der Agriculturphysik. Herausgegeben von Dr. E. Wollny. Heidelberg: Carl Winter's Universitätsbuchhandlung. Vol. I, II.

Researches in the domain of agricultural physics.

It is well known that the proper development of plants depends mainly upon the physical conditions of the soil and atmosphere, and these viewed in their relation and influence upon cultivated plants, as well as the physical conditions of the plants themselves, have been embraced under the term, "agricultural physics." The periodical, the two first volumes of which, published in 1878 and 1879, are now before

us, is devoted to the discussion of all subjects relating to the cultivation of plants and based upon exact experiments and observations. It is obvious that such a journal, properly conducted, would supply a want, and it appears to us that the editor, who is professor of agriculture in Munich, has very judiciously labored in the direction indicated, not only by the publication of original papers, but likewise by reviewing works and essays published elsewhere and falling within the scope of the "Researcher." Our space will not permit to give the titles of even the most important papers, but we may state that among others researches have been published on the carbonic acid present in the air and soil of forests; on the absorption of water by plants; on the absorption and emission of heat by the soil; on germination; on the temperature of dense and loose soils; on the consumption of water by forest trees, etc., etc.

Die Naturgeschichte des Cajus Plinius Secundus. Ins Deutsche übersetzt und mit Anmerkungen versehen von Prof. Dr. G. C. Wittstein. Leipzig: Gressner & Schramm, 1880. Price, per part, 2 marks.

The natural history of Cajus Plinius Secundus. Translated into German, with the addition of notes. By Prof. Dr. G. C. Wittstein.

The work of the elder Pliny has been translated into most European languages, an attention which it deserved already on account of the great variety of subjects comprehended by it, and because of its influence exerted upon the views held during the middle ages. The excellent translation by Prof. Wittstein, of which we have received one part, is accompanied by critical and historical notes which will be valued by most readers. The work is to be published in about 12 parts, each containing 160 pages.

A Manual of Minor Surgery and Bandaging. By Christopher Heath, F.R.C.S., Surgeon to University College and Holme Professor of Clinical Surgery in University College, London, etc. 6th Edition. Revised and enlarged, with 115 illustrations. Philadelphia: Lindsay & Blakiston, 1880. Pp. 342. Price \$2.

This work is not intended for the pharmacist, but was written with the primary object in view to offer to young surgeons, holding the responsible post of house-surgeon in hospitals and dispensaries, some hints in the treatment of the numerous accidents and emergencies daily coming under their care. The illustrations of apparatus, instruments and operations are like the text, clear and instructive, and will be found well adapted for the wants of the student in surgery. The book contains also, 61 formulas selected from the pharmacopœias of the various London hospitals.

A New School Physiology. By Richard J. Dunglison, A.M., M.D. Philadelphia: Porter & Coates. Pp. 314.

We believe that this work is well calculated to fulfill its object of imparting to the young a knowledge of the general structure of the body so as to enable them to be watchful in regard to the laws of health, which must naturally be studied in connection with physiology. The concise descriptions, shorn of many of the technical terms; the frequent comparisons with the anatomy and physiology of other animals

and the large number (117) of good cuts in illustration of the subjects discussed, render the work quite acceptable for schools. In his references to vegetables, the author has in some cases not been as precise as might be desired. When, on page 14, it is stated that, "as a general rule, vegetables contain more solids than fluids," this may be accepted, perhaps, for the large majority of strictly woody plants, but certainly not for the herbs, many of which are known to yield only from 10 to 20 per cent. of *air-dry* material. On page 15, it is said that the food of vegetables "is ready for use, and it is at once absorbed," while the food of animals requires to be taken into the stomach and digested or prepared for absorption. On page 49, the food of plants is said to be mainly water, carbonic acid, ammonia, etc. These undoubtedly have to undergo "the process by which food becomes converted to the needs of the system," *i. e.*, digestion, though in plants it is probably more correctly called assimilation. It may be "very simple," as the author tells us, but the precise manner in which the plant converts inorganic into organic compounds is still unknown.

Hygienic and Sanative Measures for Chronic Catarrhal Inflammation of the Nose, Throat and Ears. Part I. By Thos. F. Rumbold, M.D. St. Louis: Geo. O. Rumbold & Co. 1880. 12mo, pp. 174.

This work is the result of observations extending over twenty years, and showing that the successful management of catarrhal affections depend upon the faithful observance of the laws of health, and that the continued observance of proper hygienic rules are essential for the maintenance of health. The first eleven chapters on Hygienic Measures discuss the protection of the various parts of the body by proper clothing; the exposure to draughts, night air, etc.; the temperature and ventilation of the bed room; diet and stimulants; exercise and disposition of the mind. Among the sanative measures which follow, are discussed the cleansing of the nasal and pharyngo-nasal passages; the removal of hardened secretions from the nasal passages; the cleansing of the ears, the teeth; bathing and the application of oil to the body, and a lengthy chapter is devoted to tobacco and its mental and physical effects, showing that its use predisposes to catarrhal diseases. For inunction the author formerly used bland fixed oils, but these became exceedingly offensive on the body, and the author now recommends in their place the use of vaselin, under which name he evidently includes the soft paraffins, sold under various names. If, as is stated in the quotation from an essay by Dr. James Y. Simpson, the use of the oil is followed by absorption and assimilation, it is evident that the soft paraffin, owing to its different constitution, must act in a different manner, though it may produce the same result.

The book is written in such a plain but not common-place language, and with such evident sincerity, that we heartily recommend it to intelligent readers generally, believing that its perusal will lead to the adoption of measures calculated to prevent the "catching of cold."

Die Pseudomorphosen des Mineralreichs. Vierter Nachtrag. Von Dr. J. Reinhard Blum. Heidelberg: Carl Winter's Universitäts-Buchhandlung, 1879. 8vo, pp. 212.

The Pseudomorphs of the Mineral Kingdom. Fourth supplement.

Thirty-six years ago the author published his first work on the pseudomorphs, in

which altogether 164 kinds were described. So effectual has been the research in this direction that the author has now been able to describe 254 pseudomorphs by transformation and 182 such by displacement. The study of these products is of particular interest and importance in the researches on the changes which have taken place and are continually occurring in the rocks of our globe, and the work before us is perhaps the most efficient aid in such researches, since it contains all the observations on this subject which were known at the time of publication.

On the Development of Lemna minor. By Wm. Barbeck.

From the Proceedings of the Academy of Natural Sciences of Philadelphia, accompanied with a lithographic plate showing the different stages of development.

Das Verhalten des Schimmelgenus Mucor zu Antiseptics und einigen verwandten Stoffen mit besonderer Berücksichtigung seines Verhaltens in zuckerhaltigen Flüssigkeiten. Dorpat. 1880. Pp. 50.

The behavior of the mold genus *Mucor* to antiseptics and several allied compounds, with particular regard to its behavior in saccharine liquids.

The effectiveness in preventing the growth of mould was found to be greatest in corrosive sublimate and iodine, one part of each being sufficient to protect 50,000 parts of liquid. Then followed chlorine, volatile oil of mustard, thymol (1 in 10,000), sulphurous acid, bromine, potassium xanthogenate, sodium benzoate, oil of cinnamon, crude 30 per cent. carbolic acid (1 in 4,000), chlorinated lime, beechwood tar creasot (1 : 1,800), benzoic acid (1 : 1,250), carbolic acid and cresylic acid (1 : 1,000), salicylic acid (1 : 500), soda, picric acid, oil of eucalyptus (1 : 250), etc.

No preventative influence was exerted by potassium permanganate (1 : 500), aluminium acetate, chloral hydrate (1 : 70), quinia muriate, sodium carbonate (1 : 50), potassium chlorate, copper sulphate, chromic acid (1 : 5), sodium chloride, potassium nitrate and glycerin, the last three in the proportion of 1 : 4. Neither had alum any effect.

Zur Geschichte des Chinidins und Cinchonidins, und Normirung der Nomenclatur dieser Chinaalkaloide durch den chinologischen Congress in Amsterdam (April 13, 1877). By Dr. G. Kerner. Halle, 1880.

Notes on the history of quinidia and cinchonidia, and on the nomenclature of these cinchona alkaloids by the quinological Congress at Amsterdam.

The author defends the nomenclature referred to, which is the one commonly used in the United States, and opposes the introduction of Hesse's designation *conchinia* for quinidia. The pamphlet is a reprint from "Archiv der Pharmacie."

Kritische Beurtheilung der Methoden, welche zur Trennung und quantitativen Bestimmung der verschiedenen Chinaalkaloide benutzt werden. By Carl Hielbig. Dorpat, 1880. Pp. 86.

Critical examination of the methods for the separation and quantitative determination of the different cinchona alkaloids.

The author has carefully examined the analytical methods proposed by De Vrij,

Moens, Guillermond, Carles, Stoeder, Cleaver and others, and proposes a process for the valuation of cinchona bark, based upon that recommended by De Vrij, and of which the following is an outline: 2 grams of the mixed alkaloids are dissolved as acetates in 30 cc. of water and the solution mixed with 1 gram of Rochelle salt and well stirred. The precipitate contains quinia and cinchonidia tartrates, which are dissolved in 20 parts of 90 per cent. alcohol acidulated with 1.6 per cent. sulphuric acid; in this solution the quinia is estimated by iodosulphate of chinoidin, and the cinchonidia by the difference of the weights of the mixed tartrates and of the quinia tartrate. The filtrate from the precipitated tartrates yields with sodium iodide a precipitate of quinia hydriodate, and from the filtrate the remaining alkaloids are recovered by soda, dried and exhausted by absolute ether, which dissolves the amorphous alkaloid with small quantities of quinia. The insoluble portion is washed with water to remove soda, and the residue weighed as cinchonina. In the details, given by the author the alkaloidal compounds remaining dissolved in the mother-liquors and wash-waters are likewise estimated.

Vergleichende Untersuchung einiger indischen Handelssorten des arabischen Gummi, und der wichtigsten Handelssorten des Traganth und seiner Surrogate. By Emil Masing. Dorpat.

Comparative examination of several East Indian varieties of gum-arabic, and of the most important commercial varieties of tragacanth and its substitutes.

The two essays are reprinted from "Archiv der Pharmacie." The author has determined for the gums: Moisture, solubility in water, ash, HCl required for neutralizing ash, and the behavior of the gum solution to potassium silicate, potassium stannate, neutral and basic lead acetate, neutral copper acetate and ferric chloride. The tragacanth was examined for moisture, ash, HCl for neutralizing the ash, amount perfectly soluble in water on treating .5 gram with 100 cc. of water, and volume of sediment deposited in this solution after standing for two days.

Versuche über die Wirkung des Pepsins auf einige animalische und vegetabilische Nahrungsmittel. Von Friedrich Kessler. Dorpat, 1880. Pp. 48.

Experiments on the effect of pepsin upon various animal and vegetable victuals.

A large number of experiments made for the purpose of determining the comparative digestibility of numerous substances in the raw state and variously prepared.

Beiträge zur Kenntniss der Aloe. Von Carl Treumann. Dorpat, 1880. Pp. 78.

Contributions to our knowledge of aloes.

From these investigation we mention the composition of the various aloins as determined by the author: Barbaloin $C_{48}H_{55}O_{20}$, Capaloin $C_{46}H_{56}O_{20}$, Socaloin $C_{45}H_{52}O_{20}$, Nataloin $C_{45}H_{55}O_{20}$ and Curaçaoaloin $C_{44}H_{50}O_{20}$. The purgative properties of aloes are due to aloin as well as to its oxidation products; the latter being the less active, the more they differ from the former. While nataloin is without medicinal value, the doses of the other aloins are as follows: Capaloin, .12 to .16 gram; barbaloin, .15 to .2 gram; socaloin, .2 to .25 gram and Curaçaoaloin .25 to .3 gram.

Vergleichende Untersuchungen einiger Catechu- und Gambir-Proben, nebst kritischer Beleuchtung der Methoden zur Bestimmung ihres Handelswerthes. Von Adolf Lehmann. Dorpat, 1880. Pp. 66.

Comparative examination of several specimens of catechu and gambir, with critical observations on the methods for determining their comparative value.

From his numerous experiments the author regards the analytical method proposed by Günther in 1870, though not yielding absolutely correct results, at least as serviceable for approximately determining the value of catechu and gambir. In the aqueous solution the catechin and catechutannin are estimated together by Loewenthal's method by titration with potassium permanganate; afterwards the tannin is estimated alone by Schulze's method by precipitation with gelatin in the presence of sal ammoniac, and the catechin is found by subtracting the tannin from the mixed tannin and catechin. The weight of the latter is found somewhat higher on account of the presence of other soluble organic principles, and a source of error is found in the difficulty of oxydizing the solutions of different samples to the same tint of color.

Beiträge zum forensisch-chemischen Nachweise von Blut aus Flüssigkeiten, Harn, Zeug und Erden. Von Victor Schwarz, M.D. St. Petersburg, 1880. Pp. 27.

Contributions to the forensic-chemical determination of blood from liquids, urine, fabrics and earths.

Reprint from the Pharmaceutical Journal of Russia. The essay is not adapted for a brief abstract, but we may mention that the author regards the preparation of hæmincrystals, as recommended by Teichmann, and the spectroscopical examination, as furnishing conclusive evidence of the presence of blood. A solution of borax was found to be very serviceable for dissolving the blood from fabrics, sand and different earths, and after precipitating the solution with zinc acetate, for obtaining hæmincrystals from the precipitate.

The therapeutic value of the iodide of ethyl. By Robert M. Lawrence, M.D. Boston.

The Problems of Insanity. A paper read before the New York Medico-legal Society March 3, 1880. By George M. Beard, A.M., M.D.

National Association for the Protection of the Insane and for the Prevention of Insanity. Boston, 1880.

An account of the organization of this society.

Proceedings of the adjourned meeting of the Convention of Agricultural Chemists, held at Boston, Mass., Aug. 27, 1880. Raleigh, N. C., 1880.

OBITUARY.

ELWOOD GOULDY HENDRICKS, a graduate of the Philadelphia College of Pharmacy, class 1878, died of consumption August 30th last. He was born July 2d, 1857, in Centre Point, Montgomery county, Pa., and was apprenticed to Mr. Wm. K. Mattern of this city.